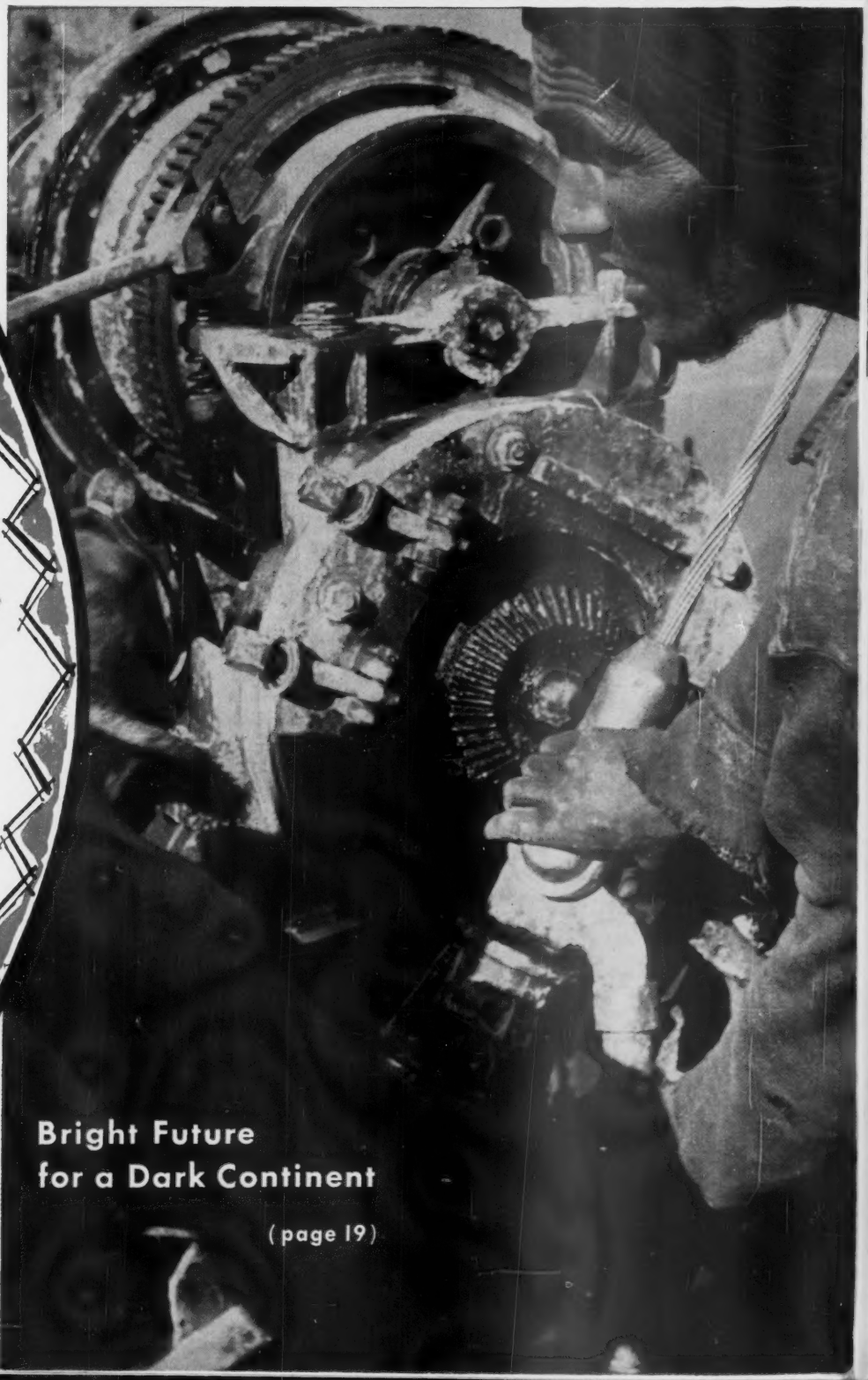
The Magazine of the Registered Professional Engineer

American Engineer

DECEMBER 1961



Bright Future for a Dark Continent

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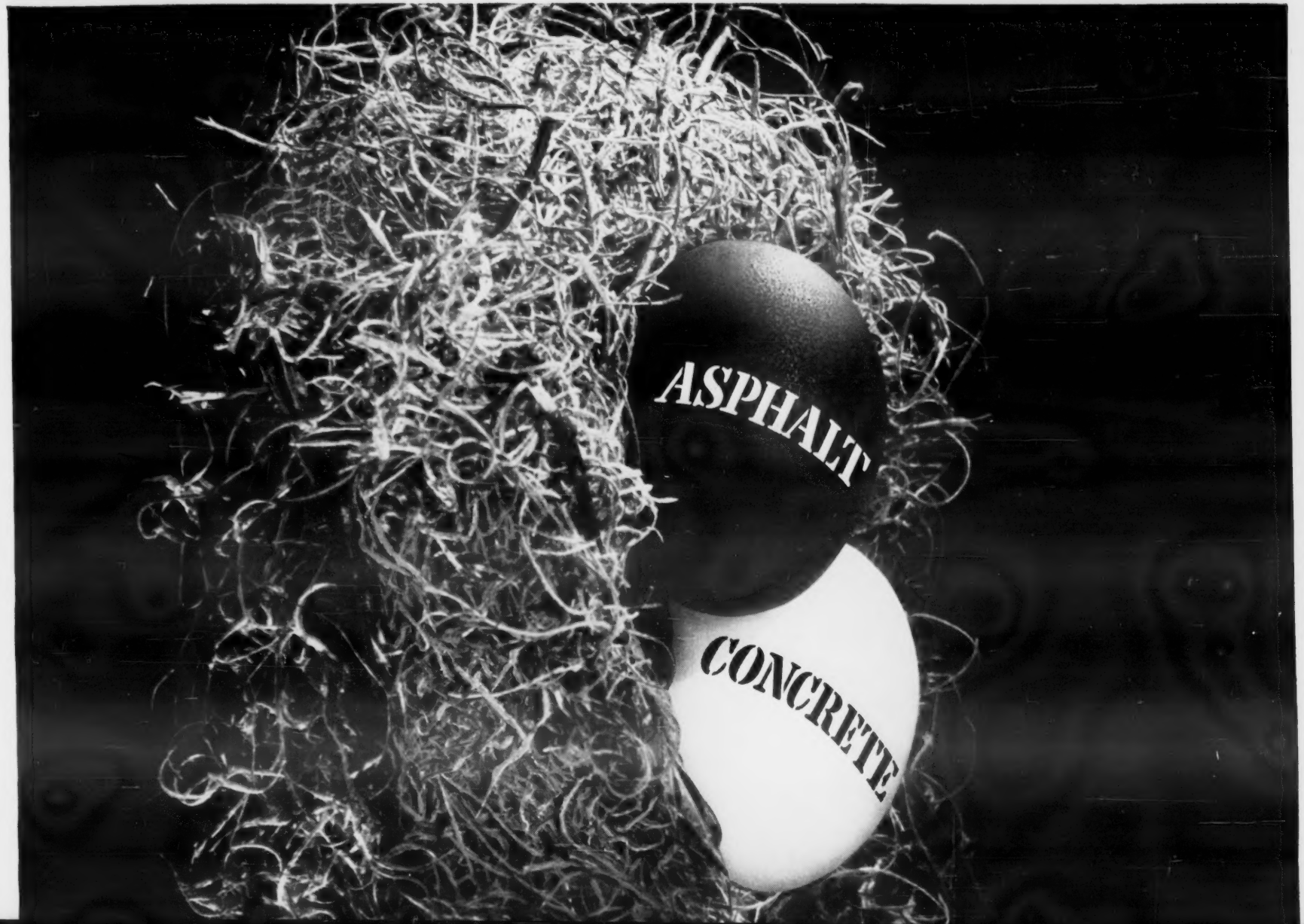
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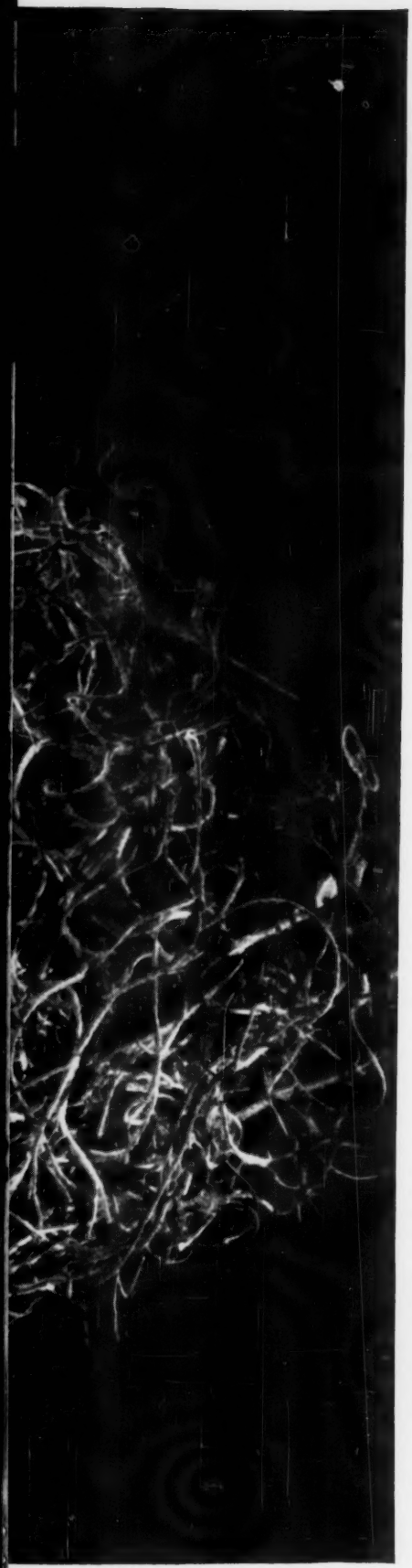

DON'T COUNT YOUR TEST ROADS BEFORE THEY HATCH

Oklahoma's test road, just north of Oklahoma City, is the latest publicly financed test road to be exploited by promoters of slab pavements before the test has been completed and the results evaluated by its sponsors.

Oklahoma highway engineers know what they are doing. No engineer who knows the facts about the Oklahoma test road will be taken in by such exploitation.

The test of a pavement is its performance over many years. The facts on the four-mile Oklahoma Test Road are that the Asphalt pavement saved Oklahoma taxpayers $103,494.37 in original construction costs. These initial savings will more than cover all present and future betterment and maintenance costs; meanwhile providing Oklahomans with a stronger pavement and a brand-new riding surface.

Time-tested, time-proved Asphalt pavements are pavements of integrity. Once an Asphalt highway, always an Asphalt highway. Not so with rigid surfaces. When concrete highways become too expensive to maintain, often in less than 18 years, they're covered over with Asphalt and lost forever on the maintenance records as a concrete pavement.

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THE ASPHALT INSTITUTE, College Park, Maryland

Letters to the Editor

Registration a Must . . .

Dear Editor:

I was recently in attendance at the NSPE Annual Meeting in Seattle and heard remarks inferring that registration was not particularly applicable to those who designed aircraft and was therefore difficult to promote.

It has always been a curious bit of speculation to me that if an engineer designs a structure, it is necessary in the interests of the health, safety and welfare of the public that such a designer have a minimum degree of engineering skill as attested to by his license. If, however, we put wings on the structure and fly it through the air at 600 miles per hour, are we to assume that the health, safety and welfare of people is no longer involved?

As a comment, accidents traced to the failure of some part designed by a nonlicensed engineer may some day be difficult to explain, particularly if lawsuits are involved which are pushed by ingenious legal minds before nontechnically educated juries.

I would suggest that all young engineers should be licensed and that increased efforts be made to have the tests for licensing meaningful in the industries involved.

JOHN GAMMELL, P. E.
Past President, Wisconsin Society of Professional Engineers,
Milwaukee, Wis.

Fund for Fanning . . .

Dear Editor:

I was amazed and shocked by the decision handed down by the Ohio courts (Fanning v. College of Steubenville—page 11, AE, June 1961). I feel it is both ill advised and an arbitrary misinterpretation of a very loosely written law. The services of an architect are merely one function of many in the successful erection of a building. With the technological trend in the design of buildings involving increasingly more engineering functions, it is fast becoming a question of which functions assume leadership. Mr. Fanning's contract specifically stated architectural (plus) structural, plumbing, heating, electrical and other mechanical work—the last five functions are distinctly engineering. If architects are permitted to perform all functions, how can the court arbitrarily say an engineer cannot perform the building design function?

Licensing laws were not written to legislate who may be allowed to assume leadership but to guard the health and safety of the public. It is lamentable that there are overlapping functions in the professions and this was recognized by the legislators when most of the laws were written. To misapply the intent of the law, however, as it was done in Ohio, is a gigantic miscarriage of justice.

Realizing Mr. Fanning's position and the very practical difficulty of personally financing an appeal, we should like to suggest that an immediate fund be raised among practicing engineers to legally pursue this matter. This is not only Mr. Fanning's battle—it is a battle which every practicing engineer will have to contend with.

KARL J. BEA, P. E.
Pulaski, N. Y.

Never-Never Land . . .

Dear Editor:

I was pleased to note in the August issue the statement by Professor Linke of Cornell, "As a result of this attitude in engineering courses, the student is placed in the never-never land where everything works exactly as the theory says it should."

As one of the great number of engineers who is neither a recent graduate nor a senior professional, I have been very much concerned by the numerous statements passed out in recent years by engineering educators in high places. Briefly summarized they lead to some most discouraging conclusions:

—No engineer can learn anything he is not taught in technical school.

—All engineer decisions are now made on a digital computer.

—There is no longer any room for experience or judgment in engineering.

May I submit that engineering being by definition "the application of scientific principles" must always remain somewhat of an art: that is, it must always remain so while consumers of its products are people.

CARL A. BROOKS, P. E.
Augusta, Maine

Taking Exception . . .

Dear Editor:

Mr. Cavanagh's article "Let's Change Preventives to Incentives" appearing in your September issue contains some misleading generalizations.

First, in defense of our profession, I would like to take issue with Mr. Cavanagh's statement that independent inventors frequently fall prey to unscrupulous patent solicitors. Despite the most strenuous efforts of professional associations to eradicate unethical practitioners and educate the public to the danger, charlatans continue to exist in all the professions, engineering and medical, as well as legal.

I cannot agree with Mr. Cavanagh's premise that a great deal of creative talent is being stifled by lack of incentive to independent inventors, and ruthless exploitation of those who are

(Continued on page 55)

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American Engineer

DECEMBER 1961
Vol. 31, No. 12

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Court Upholds Board's Right to Test Engineer Applicants

The right of the Iowa State Board of Engineering Examiners to require that an applicant pass a written examination has been upheld by the State Supreme Court, even though the applicant was licensed in another state, was graduated from an approved engineering curriculum and had a record of four years experience.

The dispute arose over language in the Iowa Engineering Registration Act which provided that the following shall be considered as minimum evidence satisfactory to the board that the applicant is qualified for registration:

"1 (a) —Graduation from an approved course in engineering of four years or more in an approved school or college; and a specific record of an additional four years or more of practical experience in engineering work of a character satisfactory to the board.

"1 (b) —Successfully passing a written, or written and oral, examination designed to show knowledge and skill approximating that attained through graduation from an approved four year engineering course; and a specific record of eight years or more of practical experience in engineering work."

The plaintiff applicant claimed that since he was graduated from an approved engineering course and had at least four years' experience, section 1 (a) gives him an absolute right to registration without an examination, and that section 1 (b) did not apply. He argued that 1 (b) was to be applied only in the case of those who have not graduated from an approved engineering curriculum.

With this contention the Supreme Court disagreed. The Court noted that 1 (a) and 1 (b) are stated as "minimum evidence satisfactory to the board," and that the plaintiff's interpretation would in effect eliminate the word "minimum" entirely, and make the qualification in 1 (a) the maximum requirement that the board could exact. "We think the board is given the right to use either 1 (a) or 1 (b) in determining the minimum standard of qualification which it will accept," the Court said. . . . "It is true the word 'or' does not appear between 1 (a) and 1 (b), but it will not avail the plaintiff here to urge that the two paragraphs should be read conjunctively, with 'and' instead of 'or' since he would then have both requirements to meet as 'minimum' evidence."

Refusing to construe the law as though the word "minimum" did not appear, the Court observed that "the word is there; the legislature put it there; and we must assume it had a purpose in so doing. If it intended the provisions of 1 (a) to mean that no other test than graduation from an approved engineering college and a record of at least four years of practical experience should be required, no possible reason for inclusion of 'minimum' appears. The statute does not admit of a construction which would eliminate this word."

The plaintiff also claimed that if the Court did not delete the word "minimum" from the statute, it is unconstitutional in that it delegates power to the board without setting up standards by which it is to be applied. To this argument the Court replied that an executive or commission may be vested by the legislative branch of the government with discretion, within certain limits, in carrying out the provisions of a statute. Applying this general rule to the present case, the Court concluded that a reading of the law in its entirety makes it clear that the legislature has set up the standards which a professional engineer must meet. "And the board, in determining whether these standards are met, may in its fair and unabused discretion require an examination or may, under 1 (a), accept certain educational requirements and experience as 'minimum evidence' of qualification, but is not required to do so."

The applicant's prior registration in another state, the Court said, was obtained without examination. He is therefore not entitled to reciprocity because without an examination requirement, the standards in the other state are "lower than ours." (*Horner v. Iowa*, Supreme Court of Iowa, August, 1961) NOTE: In the last session of the Iowa Legislature, a revised law was passed which clarifies the provisions in contention in the *Horner* case.

(Continued on page 10)

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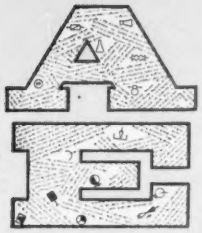


"This Month"

That trouble beset continent–Africa–recently has had its share of birth pains but those experienced in world matters can see only a bright future for this little-known area. It follows, then, that AE "This Month" should have a look at what needs to be done to compensate for the almost total lack of technical competence among these new nations. Page 19.

Our next author says that "there are few more satisfying pursuits in life than furthering the effective utilization and conservation of our natural resources." Bravo! And who can play a more important part than the engineer? In the one vital area of water alone the threat of pollution is constant. Read "Polluted Waters–A Challenge to P.E.'s", page 26.

In the wake of huge redevelopment and highway building programs, the engineer and the city planner have frequently not agreed as to approach. How can the two groups best work together for the common good? "Urban Renewal and Highway Engineering"–page 30–was done for us by the State Highway Engineer for New Jersey.

Short items of more than routine interest: Page 25: The Engineer and the Law feature deals with "State Professional Corporation Laws and Corporate Practice" . . . Page 34: An AE Special Report, "Office of Civil Defense Offers Course on Fallout Shelters for Engineers" . . . Page 35: The second in a series of short articles treating proposed changes in NSPE membership requirements, this by Past President Alex Van Praag . . . Page 44: 1962-63 Nominees for NSPE Office are Announced.

The news headlines "This Month":

General. Page 6. Court Upholds Board's Right to Test Engineer Applicants . . . Institute of Engineering Technicians Elects Officers . . . Consolidation of IRE and AIEE Under Consideration.

Industry. Page 12. New Functional Section Approved by NSPE Board . . . Engineers and Technicians Continue Strike at ITT . . . Bill on Moving Expenses Gets Approval of NSPE . . . Board Moves to Encourage Functional Section . . . Statement Issued Answering Union Attacks on NSPE . . . Humanities Play Major Role in Education of Engineers.

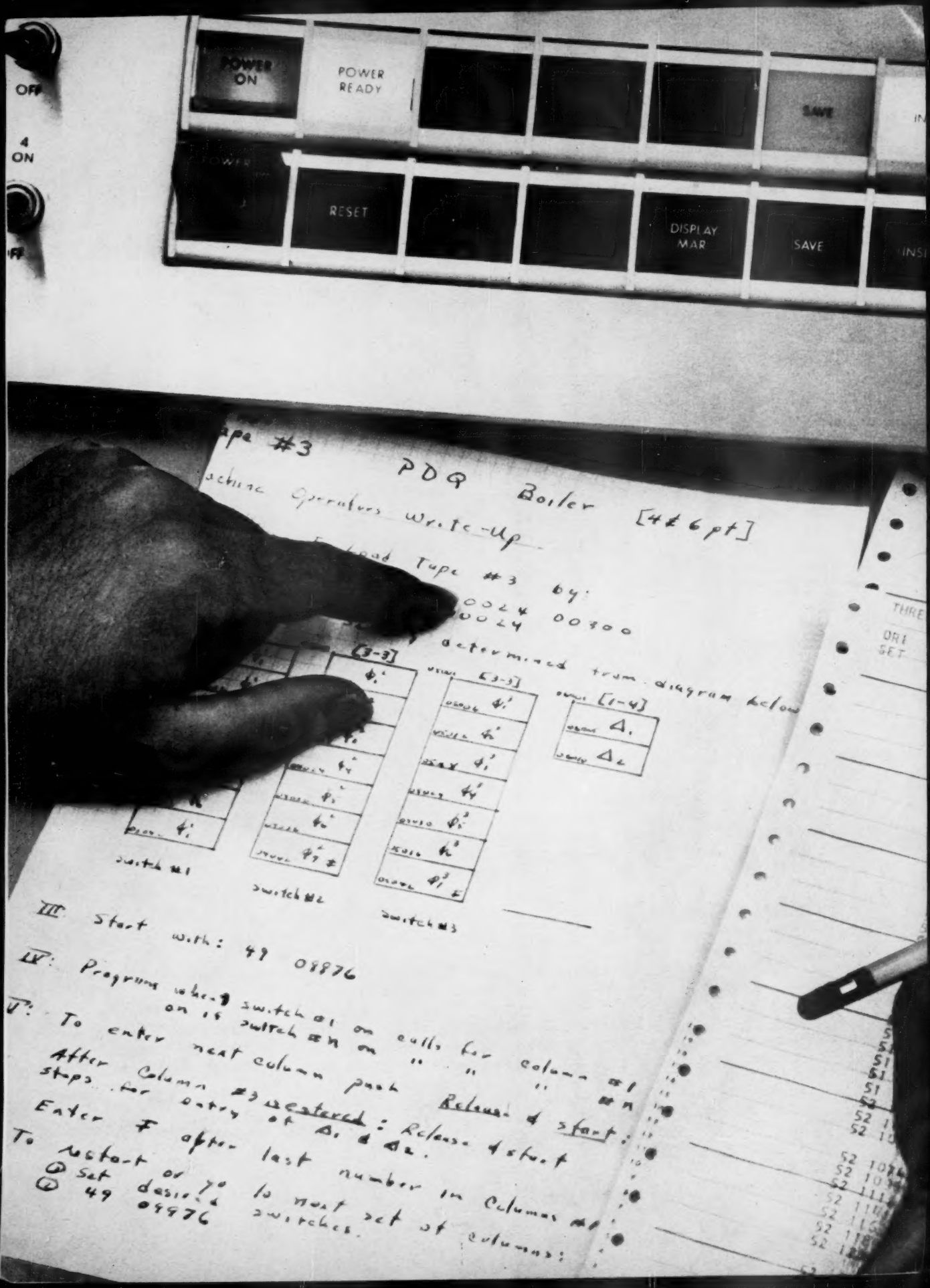
Consulting. Page 14. Functional Section Heads Confer and Plan in Roanoke. (Full Report.)

Government. Page 15. Action for Higher Salaries in Government Laboratories Taken . . . Johnson Favors More Pay for Space Engineers.

Education. Page 16. Building Research Institute to Become Separate Society . . . Engineer Graduates Score High in China Universities . . . Penn State Grant Will Establish Professorship . . . Foundation Finds Need for West Coast Engineers.

Kenneth E. Trombley

Editor


POWER ON
POWER READY
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pe #3
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achine Operators Write-up
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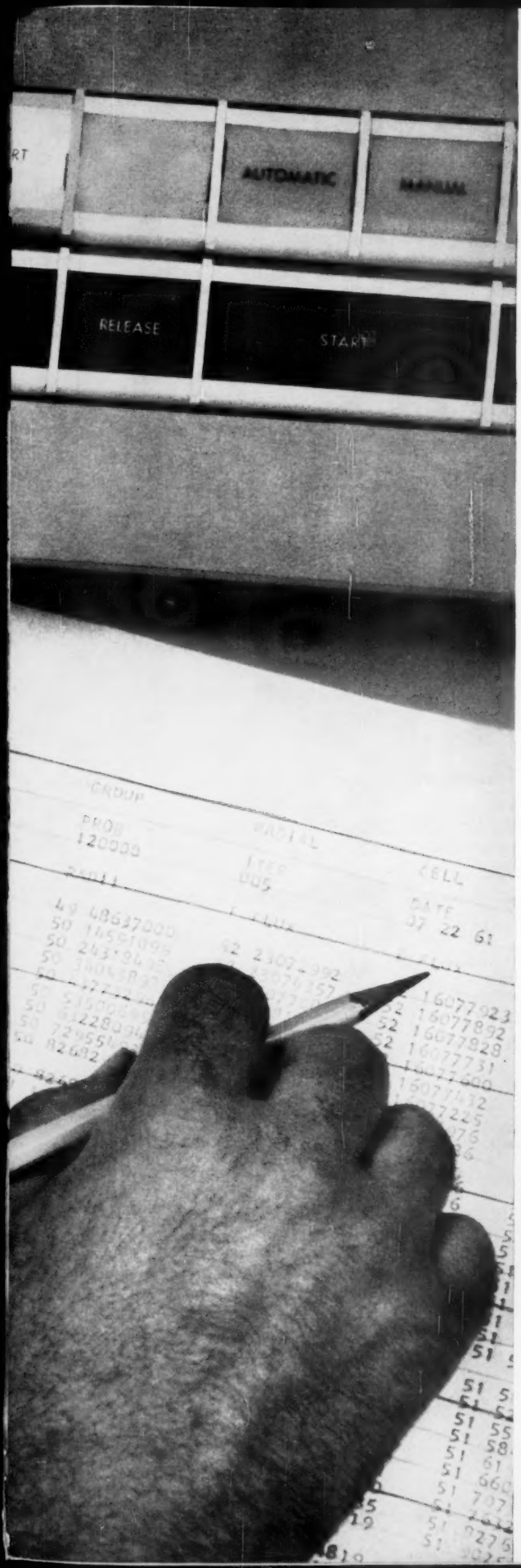
00L4
determined from diagram below
[3-3]
[1-4]
switch #1
switch #2
switch #3
III. Start with: 49 08876
IV. Program will switch #1 on calls for column #1
switch #2 on " " " #2
switch #3 on " " " #3
V. To enter next column push Release & start.
After Column #3 is entered: Release & start
steps for entry of Δ1 & Δ2.
Enter # after last number in Columns #1
To restart or go to next set of columns:
① Set desired
② 49 09976 switches.



Cost of one-dimensional criticality computations drops from an average of $75.00 to $7.50 per problem

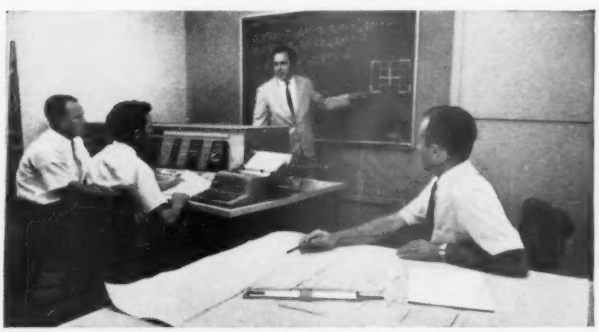
Faster computing, less travel time are the reasons why General Nuclear Engineering Corporation has realized such cost savings since it installed an IBM 1620 Data Processing System at its Dunedin, Florida plant.

Since its main computing facilities are not located at Dunedin, General Nuclear has found that the new 1620 eliminates much of the travel time and expense involved in taking problems to off-site computers. In addition, the 1620 performs the simpler criticality computations 10 times faster than the computer previously used at one of General Nuclear's off-site data processing centers.

General Nuclear uses its new 1620 for other problems, too...heat transfer calculations, various transient codes, mathematical routines for the physics and engineering departments, multi-group calculations, and many other jobs you might expect only a much more expensive computer to be able to handle.

This isn't all. General Nuclear uses the 1620 to do statistical analyses and variance calculations on input data for programs run on off-site large-scale IBM computers.

For information on this highly versatile, low-cost data processing system, which rents for as little as $1600 a month, contact your local IBM Representative.



Easy to program. FORTRAN, IBM's scientific computer language is available for the 1620. General Nuclear scientists use a special scientific interpretive program—FIDO—written by the Manager of their Computing Section.

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(Continued from page 6)

Institute of Engineering Technicians Elects Officers

Merritt A. Williamson, P.E., dean of the College of Engineering and Architecture, Pennsylvania State University, was elected chairman of the Institute for the Certification of Engineering Technicians at the first meeting of the trustees of the new NSPE-sponsored organization in Washington, D. C., last month.

During a two-day session, the Institute trustees laid plans for implementation of the certification procedures and approved the selection of Virgil E. Neilly, associate professor of engineering, Penn State, as part-time executive secretary of the Institute. Professor Neilly will administer the program from the Penn State campus under the direction of Dean Williamson for the interim period pending the establishment of the permanent Institute office in the NSPE Headquarters office.

Bernard L. Riggs, senior design draftsman, Phillips Petroleum Company, was elected vice chairman, and Kenneth C. Briegel, supervisor, engineering technician laboratory, Acro Division, Minneapolis-Honeywell Regulator Company, was named secretary-treasurer. Other trustees are: Maurice Graney, P.E., dean, school of engineering, University of Dayton; Frederick Cummings, manager, gas turbine drafting, General Electric Company; Joseph M. Parish, P.E., engineering manager, engineering construction services division, Dow Chemical Company; and Oliver S. Hammer, P.E., vice president and director of training, United Electronics Labs, Inc. A fourth technician member of the eight-man group remains to be selected.

A change in title for the first grade of certification, "junior engineering technician," in place of "engineering technician trainee," will be recommended to the NSPE Board of Directors by the Institute. This grade covers those entering the technician field and requires two years of elementary technician experience. The trustees voted also to recommend that the same grade be accorded graduates of ECPD-accredited technical institutes without the two-year experience requirement. The other approved grades are for engineering technician, requiring an additional five years of experience, and senior engineering technician, requiring an additional ten years of experience beyond the engineering technician requirement. The two higher grades will also need to be supported by endorsement of experience by professional engineers under whom the technician has worked. Examinations may be required of applicants at the discretion of the Institute Board of Trustees.

A broad scale program of publicity and requests for cooperation from interested technical societies will be launched as soon as final program details have been developed.

Meetings of Note

American Institute of Chemical Engineers—Annual Meeting, December 3-6, Commodore Hotel, New York, New York.

Highway Research Board, National Academy of Sciences, National Research Council—Annual Meeting, January 8-12, Sheraton-Park Hotel, Washington, D.C.

National Plant Maintenance and Engineering Show—January 22-25, Convention Hall, Philadelphia, Pennsylvania.

Institute of Aerospace Sciences—Annual National Meeting, January 29-31, Hotel Astor, New York, New York.

Society of Plastics Engineers—Annual Technical Conference, January 30-February 2, Penn-Sheraton Hotel, Pittsburgh, Pennsylvania.

Discussing Technicians

Meeting at the National Society Headquarters in Washington, D.C., recently to make plans for the Institute for the Certification of Engineering Technicians were (l. to r.): Bernard L. Riggs, Merritt A. Williamson, Kenneth C. Briegel, Maurice Graney, Oliver S. Hammer, Frederick Cummings, and Joseph M. Parish.

Consolidation of IRE and AIEE Under Consideration

Announcement was made to the press recently of a consolidation between the Institute of Radio Engineers and the American Institute of Electrical Engineers which is presently under consideration.

The two large engineering societies have a combined membership of over 150,000 which consists of engineers, scientists, educators and industrialists. A joint committee to study the possibility of the consolidation and the form it would take has been established by the boards of directors of both organizations. Among the members of the committee are Lloyd V. Berkner, president of IRE, and Warren H. Chase, president of AIEE.

VALVE TIPS:

How to Select Automatic Regulating Valves For Temperature Control

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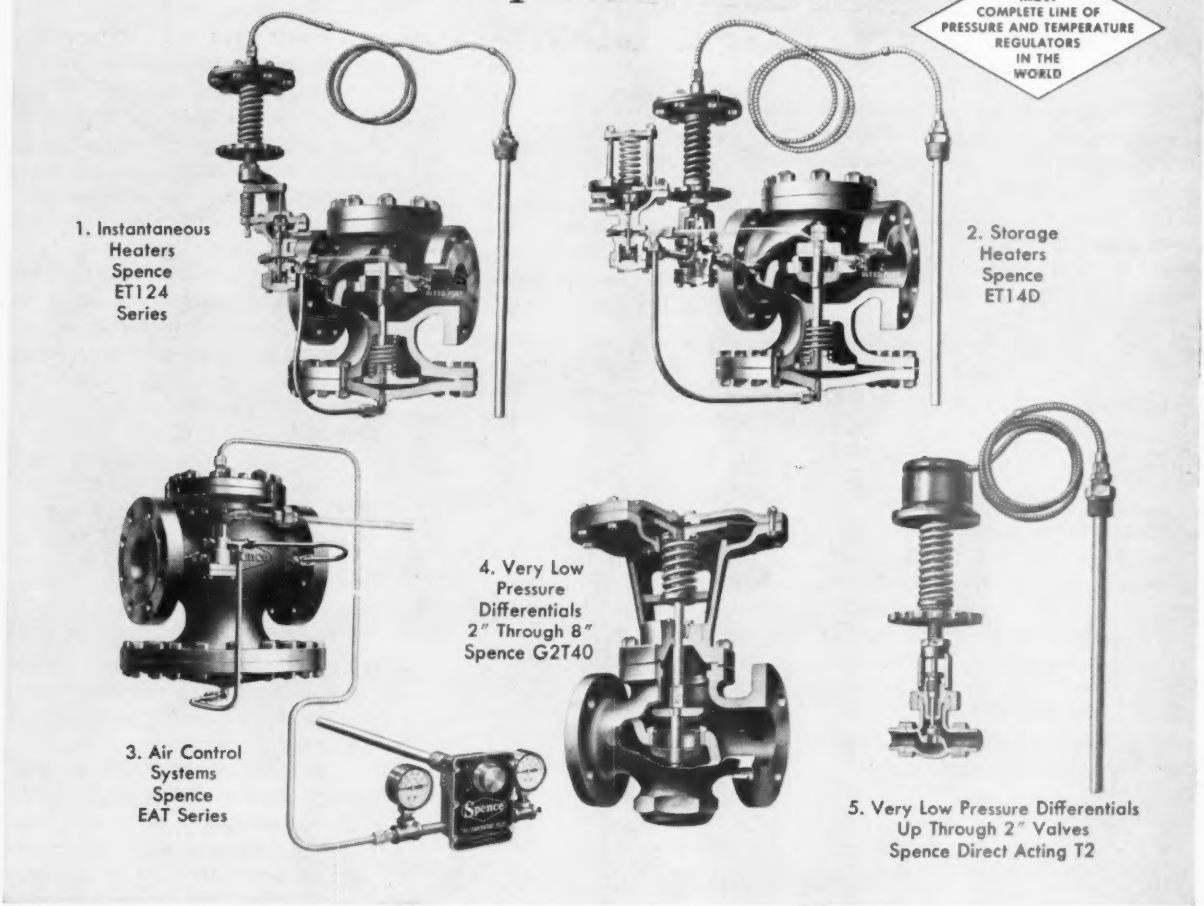
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During the past year, our field representatives have reported many cases of improperly, and uneconomically, applied temperature regulators. To help you avoid some of these costly mistakes, here are a few tips on selecting the most effective and economical temperature regulating valves for your applications.

1. Instantaneous heaters require a special action for close temperature control and freedom from hunting. In the Spence ET124 series, steam pressure is modulated according to temperature (demand) and is automatically regulated at any pressure established by the demand.
2. Storage heaters, on the other hand, are more economically controlled by the Spence ET14D, which includes a simple temperature-actuated pilot that opens and closes the main valve to maintain a constant temperature.
3. Air control systems can now have a ±5°F control accuracy under wide and instantaneous load swings with the Spence EAT regulator. Engineers report savings of up to 50% in installed costs with this recently developed Spence cascade system when it has been used in place of conventional instrumentation.
4. For the combination of very low pressure differentials and air or water control, Spence recommends Type G2T40. This single seated pilot operated valve provides fast, positive response in 2″ through 8″ valves. Double seat Type G22 is also available in 10″ through 12″.
5. When very low pressure differential is encountered with valves of 2″ or less, the Spence direct operated T2 is recommended. The sensitive vapor tension thermostat responds quickly to small changes in bulb temperature for continuous, accurate control.

In this brief description of industrial process and heating temperature control, we have given a few important tips in proper regulator selection. If you would like more detailed information on these control applications, write for the new Spence Temperature Control Bulletin IV 1014. SE-150

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(Circle 4 in Readers' Service Dept.)

New Functional Section Approved by NSPE Board

Following up an earlier plan to form a functional section for engineers in industry, the NSPE Board of Directors has approved rules of procedures and operations for the new organization drawn up by the Engineers in Industry Committee.

The action was taken at the fall professional meeting of the NSPE Board in Roanoke, Virginia, October 21. Permission to go ahead with the plan had been given when the Board met in Seattle last July.

The rules of procedures and operations for the new group, to be known as "Professional Engineers in Industry," will operate basically as follows:

—The broad objectives are "to promote cooperative relations between engineers and management in furtherance of high standards of professional service and employment, and to advance the professional development and economic interests of the industrially employed engineer."

—Although only NSPE members may vote or hold office, nonmember engineers who belong to sounding board groups affiliated with NSPE state societies or chapters may also participate.

—Officers will consist of a chairman, immediate past chairman, and four vice chairmen. They will be elected annually at a general meeting to be held at the time of the Annual Meeting of NSPE. The NSPE Board voted to allow the present Engineers in Industry Committee members to serve as an "ad hoc" executive board until elections can be held at the next annual meeting in French Lick, Indiana, in June, 1962.

—The chairman will be a nonvoting representative to the NSPE Board of Directors and will present a report to the Board at each meeting.

—The officers will serve as chairmen of section committees covering the areas of ethics, employment practices and standards, professional employee responsibilities, publications, and state and chapter section coordination.

Engineers in Industry Committee Chairman Richard Hoft, of the General Electric Company, stressed to the NSPE Board that the new section "will permit individual engineers in industry to achieve a closer identification and participation in NSPE activities of particular concern to their special interests than is possible at the present time with a committee structure." In addition, the structure of the new group will allow a broader range of activities, including greater action at the local level.

Engineers and Technicians Continue Strike at ITT

About 850 engineers and technical employees, represented by International Union of Electrical Workers Local 400, are on strike at the International Telephone and Telegraph Corporation Laboratories in northern New Jersey in a contract dispute over wages, subcontracting, and merit promotions.

After negotiations broke down on October 2, the engineering-technical unit, and units of clerical-drafting, and shop-maintenance employees went out on strike. A total of about 1500 employees are represented by Local 400.

A major issue is ITT's proposal to eliminate a prohibition on subcontracting when the work of any job group has been reduced by at least five per cent through lay-off. Other issues include changes in the merit promotion system, which now calls for union participation in reviews, and seniority.

The parties also disagreed on wages. The company offered increases of seven cents an hour this year and five cents next year, while the union demanded a seven per cent increase this year and five per cent next year.

Bill on Moving Expenses Gets Approval of NSPE

The NSPE Board of Directors has approved a recommendation by the Engineers in Industry Committee to give Society endorsement to the Boggs bill, currently awaiting action by the House of Representatives.

The Boggs bill (H.R. 638) would remove the present requirement that newly hired employees declare employer-paid moving expenses as income. In their report to the Board the Committee noted that the Internal Revenue Service currently allows company payment of moving expenses for employees already on the payroll without requiring the employees to declare the value of these costs as income. The Committee pointed out that the present distinction drawn between newly hired employees and transferred employees is discriminatory.

Board Moves to Encourage Functional Section

In line with aims to encourage the activities of affiliated chapter and state functional sections and sounding boards, the NSPE Board

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approved at its recent Roanoke meeting, an addition to NSPE policy recommended by the Engineers in Industry Committee. The new statement, embodying in principle a prosposal from the New York State Society of Professional Engineers, adds the following language to NSPE Administrative Policy No. 35, covering the actions of affiliated groups:

"Affiliated sections are encouraged to communicate with engineers and management in order to improve the professional service of individual engineers, to promote high standards of professional engineering employment policies and practices, to advance the economic interests of professional engineers, and to consider other matters of mutual interest. Such activities when carried out in a professional atmosphere and on a professional plane, reflect the highest ideals of the engineering profession and the National Society and at the same time provide a practical solution to a problem which exists on the modern industrial scene."

Statement Issued Answering Union Attacks on NSPE

The NSPE Engineers in Industry Committee has issued a statement answering recent union attacks on a new NSPE policy which permits professional engineers to assume the duties of striking nonprofessionals. The statement came in the Committee's report to the NSPE Board at its recent meeting in Roanoke, Va.

The language of the policy permits engineers to assume nonprofessional duties "in those cases where the assumption of such duties is for the protection of the health and safety of the public or the security of the nation."

Unions have argued that the public welfare is adequately protected by the Taft-Hartley Act, which authorizes the President to seek a court injunction against a striking union when he feels the public is endangered. Therefore, say the unions, it is not NSPE's business to judge public welfare.

In its report, the Committee stated that it was not the intention to set NSPE up as judge in such matters. "We would point out, however, that in practical application the Taft-Hartley injunctive process could take several days or weeks, and during this interim period workers in a key operation would be on strike. It is during this period that our policy can effectively provide a guide for the proper professional conduct of professional engineers."

"It is also important," said the Committee, "to realize that in many cases strikes have occurred in local situations which were not covered by the injunctive provisions of the Taft-Hartley Act." When such strikes endanger the public health and safety, the Committee stated that the NSPE policy fulfills a definite need.

Humanities Play Major Role in Education of Engineers

Today's engineer knows how to build a skyscraper or design a missile, but he must also learn what makes the human heart tick.

"At a time when much of the fate of humanity depends on the decisions of the engineer, his scientific and technical skills must be matched by his knowledge of humanities."

This opinion, based on a decade's experience in teaching engineering students that "both a poem and a bridge are structures," comes from Dr. William H. Davenport, chairman of the Humanities Department at Harvey Mudd College. He sees four major reasons why the humanities must play a major role in the education of future engineers:

(1) Whatever the engineer does affects society and is judged by how well it meets human needs.

(2) The engineer cannot live for his profession alone. He is also a member of his community and a citizen of his country. As a human being he owes it to himself to develop every facet of his personality and to live a fully civilized life.

(3) Most present employers of engineers prefer well-rounded professionals to narrow specialists, especially when looking for potential managers and executives.

(4) Humanities studies can help the engineer in applying his professional attitudes and skills to the solution of social, political and economic problems.

During the coming year Dr. Davenport and the Educational Development Program Committee will review the current humanities program for UCLA engineering students and at the same time develop a more balanced and concentrated program.

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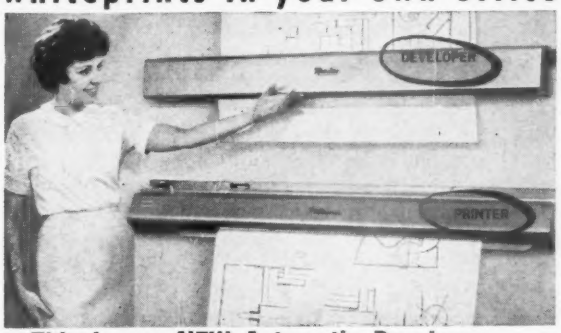

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(Circle 6 in Readers' Service Dept.)

Functional Section Heads Confer and Plan in Roanoke

In an action-packed session at Roanoke, Virginia, the Executive Board of the NSPE Functional Section for Engineers in Private Practice last month voiced criticism of a proposed "Guide for Collaboration for the Design Professions." At the same meeting they endorsed the publication of a "Guide for the Selection of Engineers in Private Practice," developed by the Coordinating Committee on Relations of Engineers in Private Practice with Government, and completed plans for a meeting of Functional Section representatives with Federal Highway Administrator Rex M. Whitton to discuss a number of points in the administration of the highway program affecting consulting engineers.

Appointments to Functional Section Committees were completed and approved and committee heads reported progress on their studies in such areas of interest as relationship between planners and consulting engineers, methods of payment for engineering services, development of check lists for engineering contracts and designation of aspects of surveying which are of a professional nature. Also, the Executive Board members discussed a pending bill to authorize the Secretary of Commerce to pay states for engineering services under the highway program only those sums which he considers "reasonable." A special committee headed by Past Section Chairman L. M. Van Doren was appointed to study the implications of the legislative suggestion. Also referred to committee was a request from the NSPE Ethical Practices Committee for comment and recommendation on changes in the Canons of Ethics and Rules of Professional Conduct relative to consulting engineers taking contracts on a contingent fee basis.

Following extensive discussion of the latest draft of the "Guide for Collaboration," developed by a subcommittee of the EJC-AIA Joint Committee, the Functional Section Board declared that the document was unduly restrictive and unrealistic and would lower the status of the engineer in the design professions. The Executive Board action pointed particularly to the language of the draft which states that architects should be the coordinators on "general building projects." The broad statement, it was noted, ignores the fact that many building projects are preponderantly engineering in their concept and scope. Objectives were also voiced to the division of engineering functions by branch and to language which could be construed to permit landscape architects or planners to handle engineering assignments. The Executive Board further noted that the Guide draft proposed a new interprofessional code of ethics for the design professions which, it was felt, was not as clear or valuable as the "Interprofessional Principles of Practice for Architects and Engineers," developed some years ago by a joint NSPE-AIA-ASCE Committee and widely circulated in the engineering and architectural professions for general guidance.

The Board heard a report on the outlook for the selfemployed retirement bill in the next session of Congress and authorized continued support of the bill and the American Thrift Assembly through the 87th Congress. A preliminary report was also received on a survey of state highway departments to determine their official policies and practices on retention of consulting engineers for work under the Federal-aid highway act. Initial returns indicate that most states do not have official published policies on the point. The comments will be analyzed, however, to ascertain the general pattern of state action and reported in a later issue.

Under a change in policy, *Private Practice News* will be sent after December 1 only to members of NSPE in order to comply with Post Office regulations. Consulting firms have been notified of the change and requested to submit individual member requests to stay on the mailing list. The Executive Board requested those now receiving the publication to take prompt action by returning the card which was enclosed with the letter sent to firms or by writing individual letters.

Vice Chairman James F. Shivler of the Southeastern region reported the completion of arrangements for a functional section of the Florida Engineering Society, "Consulting Engineers of Florida." The Florida group will be composed of sustaining firm members, sustaining individual members affiliated with the sustaining Florida firms and nonvoting participants who are members of the Florida Engineering Society interested in the functional section work.

In his report to the NSPE Board of Directors, Functional Section Chairman George S. Rawlins said there has been increased interest in the relationship between planning and professional engineering and that a special task force under the leadership of L. E. St. John was conducting a survey to determine the nature of relations between the two groups in all the states. He also advised the Board of the Functional Section's participation in the work of the Joint Coordinating Committee and the development by that group of a "Position Paper on Engineering for Government," which was published in full in the October issue of the AMERICAN ENGINEER.

Action for Higher Salaries in Gov't Laboratories Taken

Defense Secretary Robert S. McNamara has taken action to provide greater recognition and higher salaries to engineers and scientists working in Government laboratories. In addition, the Secretary has indicated that in-house laboratories will be utilized as the "primary means" for carrying out Defense Department programs, although contract organizations will continue to play an important role in research and development.

The new Defense policy was announced in a recent speech by Dr. Harold Brown, director of defense research and engineering. It is designed to correct what Brown described as "bad" morale, and a trend for many of the most promising men to leave with few being brought in to fill senior positions from industrial and university laboratories. Unless Government laboratories can retain talented people and get new blood, Brown warned, the result will be "more and more mediocrity."

Chief among the Government's problems, Brown said, is low salary levels. The failure of the Defense Department to press Congress for higher pay ranges and more super grade positions has created the impression that the Department places a low value upon the work of leading engineers and scientists, he said. The "fringe" benefits of Civil Service are not strictly comparable with the benefits enjoyed by the senior engineer or scientist in industrial or many university-affiliated laboratories, Brown added.

"In some of the best laboratories, the disillusionment with the Defense Department and the Military Services as managers is approaching the critical state." While leading engineers and scientists do not make unrealistic demands for technical ability in the management agency, he explained, "they may feel frustrated when there are too many layers of intervening managers, with the chance that lack of understanding of the operating problems may be involved.

The Secretary of Defense, Brown said, is aware of these fundamental problems, and has expressed several basic principles for strengthening in-house laboratories:

(1) The Government laboratories will be used as a primary means of carrying out Defense Department programs.

(2) Clear lines of technical management and responsibility will be established for each in-house laboratory.

(3) Full and complete advantage shall be taken of the existing PL-313 provisions which set compensation rates for senior technical personnel in the Defense laboratories. This specifically includes recognition of outstanding performance by the working scientists and engineers who are not in administrative positions.

(4) The Department of Defense will make every effort to secure rates of compensation for its senior personnel which, commensurate with the responsibilites which they exercise and with their professional talents, are consistent with levels set outside as well as inside the Government service.

Johnson Favors More Pay for Space Engineers

Vice President Johnson, statutory head of the Nation's space program, has officially added his voice to a campaign to obtain higher pay for key engineers and scientists. Speaking before the American Rocket Society, the Vice-President said "We in Government must find a way to offer top competence more than a large sacrifice and a small paycheck." One of the major problems confronting the space effort stems from the Government's own rules which prevent it from competing for talent with private organizations, Mr. Johnson said. "All too often, the Government space installations are training grounds for the highly paid technicians and vice presidents of private industry," he added. "We lose far too many of our best people."

Also urging improved compensation arrangements for Federal engineers and scientists was David E. Bell, director of the Bureau of the Budget. "It makes no sense to deliberately set barriers in the way of bringing able men into Government," Bell said recently. In his opinion, there should be some pay differential favoring industry, but present low Federal pay scales for top men are self-defeating; government agencies simply contract out more work to private laboratories, which can pay the high salaries needed to get topnotch men.

Meanwhile, current reports indicate that both the House and Senate Civil Service Committees will undertake surveys to determine how Federal salaries compare with the rates paid in private industry for comparable jobs. A Civil Service Commission study, which has not been officially made public, is reported to reveal a startling lag in top bracket Federal salaries. Finally, this December the Bureau of Labor Statistics is expected to release its second annual national survey of administrative and professional salaries in private areas of employment. The BLS study is designed to permit a direct comparison between Federal pay and private industry pay on a job-level basis.

Building Research Institute to Become Separate Society

National Research Council of The Academy of Sciences announced recently that the Building Research Institute, a constituent part of the Division of Engineering and Industrial Research, will become an independent technical society for the building sciences late next year.

In making the announcement, Dr. Detlev W. Bronk, president of the Academy-Research Council, said, "The Buckley report, which recommended in 1951 the establishment of the Building Research Institute within the Academy-Research Council, recommended also that the Institute be encouraged to work toward independent status. It is truly gratifying that—within the span of a decade—the Institute has established itself as a uniquely effective instrument for the stimulation and correlation of interdisciplinary research in the building industry, whose extraordinarily diverse interests otherwise depend upon the attention of nearly 500 separate associations in the field.

"The Building Research Institute, like other organizations which were born and nurtured within the Academy-Research Council until they were strong enough to take their own course in service to the Nation, has demonstrated that a neutral forum for the presentation and dissemination of research findings is of value to science, and the industry from which it derives its support."

In an accompanying statement, Leon Chatelain, Jr., president of the Building Research Institute, said that the change of status will ". . . make no changes in the organization except to encourage BRI to further broaden its activities in the stimulation of needed new building research, to administer cooperatively sponsored research projects, and to accept grants for the execution of valuable projects consistent with its purposes."

Engineer Graduates Score High in China Universities

More than a third of Communist China's 1961 college graduates were young engineers, according to reports carried recently in the *New York Times*.

The recent article noted that Communist China's universities have graduated a record high of 160,000 students, 27,000 more than graduated in 1960. Second highest category, slightly less than a third, were trained teachers. Sizeable groups among the remainder were doctors—19,000, and agricultural specialists—10,000.

The Communist press was quoted as commenting on the figures, "College students in new China are trained in accordance with the needs of the country," giving added significance to the notable number of engineering graduates.

Penn State Grant Will Establish Professorship

A distinguished professorship in engineering has been established at the Pennsylvania State University with a grant from Rockwell Manufacturing Company, the first corporation to take part in the University's new Great Scholars Program.

The annual grant of the company will be sufficient to meet the salary of the scholar, the salary of the secretary, and incidental expenses such as travel. The participating corporation has further agreed to support the program for a minimum period of five years with a pledge of $125,000.

Foundation Finds Need for West Coast Engineers

The need for engineers in Southern California may increase by as much as 26 per cent between now and 1965, and by another 28 per cent between 1965 and 1970.

These estimates are based upon reports from 20 representative companies, in response to a survey made by the Hertz Engineering Scholarship Foundation. Most of the companies queried are engaged in National defense work. Others included a major utility, a large chemicals manufacturer, and several producers of consumer and industrial goods.

The Hertz Foundation believes the study indicates a soon-to-be-felt shortage of engineering manpower. With fewer engineers available, recruiting costs to employers can be expected to increase significantly in the next few years. According to figures reported in the survey, the cost of recruiting an engineer presently runs as high as $8000, in the experience of one company. Many other companies reported recruitment costs from $2000 to $3000 per man.

The purpose of the spot survey by the Hertz Foundation was to obtain some guidance as to how many —and what types of—engineers will be needed in the future.

The Foundation, established in 1957 upon the personal fortune of the late John D. Hertz, offers scholarships to high school students who show outstanding qualifications for engineering careers, and who state their intention to serve the United States government at its request in time of National emergency.

The Hertz Foundation does not solicit funds for scholarships, but has a program to help companies set up scholarship programs in their own names and will administer them, if desired, without fee.

Strictly Business

Personalities . . . **Bradford K. Sturgis** has been named to the position of manager—association activities and corporate standardization for **I-T-E Circuit Breaker Co.** of Phila., Pa. . . . **Donald G. Espey** has succeeded **W. J. Reitze** as manager of sales engineering for the **Esso Standard Region, Humble Oil & Refining Co.** . . . **Jack I. Salzberg** has been named president of **Cal-Tech Systems, Inc.,** Glendale, Calif. . . . **James R. Lampman,** of the **GE Company** has been elected president of the **Society of Plastics Engineers** . . . **Leigh A. Brite** has been named vice president in charge of the **Technical Products Div.** of **Packard Bell Electronics,** Los Angeles, Calif. . . . **Industrial Electronic Engineers, Inc.,** has appointed **Robert K. Burtner** as marketing and sales director . . . **Charles A. Mitchell** has joined the **Dictograph Products Inc.,** Danbury, Conn., as vice president in charge of marketing . . . **Warren E. Racine** has joined the staff of **Traid Corp.** as assistant to the general manager . . . **R. J. Lyman,** chief engineer, **Atlas Structural Concrete, Inc.,** El Paso, Texas, has been elected president of the **Prestressed Concrete Institute** . . . **Ward B. Browning, Jr.,** has been named chief engineer of the **Armco Div.** of **Armco Steel Corp.** . . . **James B. Wiseman** has been elected vice president of **E. L. Bruce Co.,** Memphis, Tenn.

Mr. Sturgis

E. I. Henning has been appointed general manager of the Sulphur Springs, Tex., plant of **Rockwell Manufacturing Co.** . . . **Dr. Robert Phyfe Madden** has joined the staff of the **Atomic Physics Div.** of the **National Bureau of Standards** . . . **American Measurement and Control Inc.,** has named **Dr. Frederick D. Ezekiel** as general manager . . . **Arthur E. Cooper** of the **IBM's Federal Systems Div.,** Rockville, Md., has been promoted to manager of research and engineering . . . **R. L. Boorman** has been appointed director, corporate planning and control for **Kaiser Steel Corp.** of Oakland, Calif. . . . **Leece-Neville Co.** of Cleveland, Ohio, has named **Robert G. Hill** as vice president of sales . . . **Charles J. Allen,** associate in the firm of **Albert Kahn Associated Architects and Engineers, Inc.,** has been appointed assistant chief mechanical engineer of that firm . . . **RCA's Aerospace Communications and Controls Div., Defense Electronics Products,** recently appointed **D. C. Arnold** as chief engineer . . . **Roger L. Hosfield** has joined **Hevi-Duty Electric Co.** as product manager . . . The appointment of **Jack Engle** as sales promotion manager for **Le Roi Div., Westinghouse Air Brake Co.,** was announced recently.

Mr. Henning

John D. Winter recently joined the partnership of **Dames & Moore,** Los Angeles, Calif. . . . **Leslie S. Wilcoxson,** vice president of **The Babcock & Wilcox Company's** Boiler Division, has been elected chairman of the **Welding Research Council-Engineering Foundation** . . . **Koppers Company, Inc.,** has appointed **A. B. Fisher, Jr.,** as chief engineer of the Engineering and Construction Div. . . . Appointment of **Robert Wolpert** as chief engineer of **Peerless Electrical Products** was announced recently . . . **William J. Tarnowski** has been appointed sales engineer of **Trane Company's** sales office in Springfield, Mass. . . . **The White Motor Company** has appointed **H. D. Weller** as vice president, director of marketing in charge of the White Division . . . **Robert Lindberg** has joined **Edcliff Instruments** as director of sales it was announced recently. . . . **Donald W. Hunt** has joined the staff of **Engineers Incorporated,** Newark, N. J., as assistant to the vice president . . . **Dr. Stanley Hills,** research scientist has joined **The Electric Storage Battery Company** . . . **R. O. Hull and Company, Inc.,** Cleveland, Ohio, has named **Dr. Merton M. Beckwith** as vice president and technical director . . . **Jack Orsborn** has joined the staff of **Brad Thompson Industries, Inc.** in Indio, Calif.

Mr. Winter

Irwin Rowe has joined the Aero-Space Div. of **Tenney Engineering Inc.** as project engineer . . . **Jack H. Bernstein** has been appointed general manager of **CompuDyne Electronics, Inc.** . . . **Special Devices, Inc.,** has appointed **Jack Arnold, Jr.,** director of marketing . . . **Harry H. Haas** has been elected president and general manager of **Duval-Wright Engineering Co.** of the Florida unit . . . **Houdaille Industries, Inc.** has promoted **Victor G. Aubry, Jr.,** to vice president and general manager of **Houdaille Construction Materials, Inc.** . . . **Philip R. Scarito** has been appointed works manager for the Flemington, N. J., vinyl polymer plant of **Cary Chemicals, Inc.** . . . **Ingersoll-Rand Financial Corp.** has elected **William A. Dobbs** as president . . . **M. Stuart Roesler** has recently joined **Kawecki Chemical Co.** as vice president and treasurer . . . The appointment of **William C. Quinn** as director of engineering was announced recently by **Fairmount Chemical Co., Inc.,** Newark, N. J. . . . **Dan M. Krausse** recently joined **Dresser Industries, Inc.,** in Dallas, Texas, as vice president . . . The appointment of **Anthony R. Bernardi** and **Brian Langford** to the engineering staff of **Manson Laboratories, Inc.,** Stamford, Conn., has been announced by the company.

Mr. Rowe

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Bright Future for a Dark Continent

To the avid and average newspaper reader, the continent of Africa would seem a good place to avoid. Civil strife, racial violence, wars, riots, assassinations and an occasional incident of cannabalism make up enough of the headlines to keep the faint-hearted citizen at a respectful distance.

If this weren't enough, the geography of Africa commands no small amount of respect itself. New nations appear overnight, and have been known to dissolve just about as rapidly. Simply listing a few—Togo, Chad, Ruanda-Urundi, Mali and Nyasaland—will probably leave many people scratching their heads. A superficial glance at African politics is hardly more encouraging. Racism, violent nationalism, and touches of communism are hardly encouraging to the American businessman who takes a look at the situation.

But for the American businessman, and for the American engineer, there is another side of the coin as far as Africa is concerned. Almost without question, Africa represents today the single largest untapped market in the world. Perhaps more important, Africa also represents one of the largest sources of natural wealth in the world, and this too is largely untapped. Manpower, minerals, hydroelectric power and acres of unused land are a few of these assets.

Inevitably, it will be the job of the engineer to utilize these resources. Because there is a dearth of engineering talent in Africa, it follows that much engineering skill will have to be imported. And of course, there is no reason why the U. S. engineer should not be well represented.

The mammoth engineering task that will face the firm or individual going into Africa can only be compared to the opening of the west in the U. S. From a technical standpoint, there are virtually no foundations on which to build. What in this country might be a relatively simple job of mining engineering can be complicated almost beyond imagination in the new nations of Africa. For instance, before the ore can be extracted, air fields and roads must be built in order to move in the necessary equipment.

Before the ore can be brought out, quite often railroads must be constructed through the densest of jungles, and ports built on undeveloped shorelines to export the ore. Further, it may be necessary to construct an entire town for the personnel who would be needed to work the mine. All of this effort may have to be performed in areas where rainfall may be as high as 300 inches a year.

The obvious question is "Why bother?" The answer lies in the resources that are there to be developed. Ghana and Guinea are two of the smallest African nations. By the estimation of one U. S. industrialist, the combined bauxite resources of the two nations are large enough to substantially affect the world aluminum market.

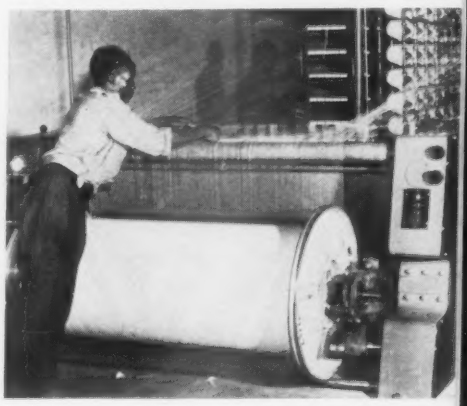
Or, consider the double-edged advantage of Nigeria. With a population of some 40-million, both manpower, and eventual buying power are great assets, indeed. But here, as in many of the other African nations, technical skills are desperately needed. Not only is there the need for outright technical aid, but there is also an even greater need for technical training within the nations. It is difficult to realize that many of Nigeria's 40-million people were brought up in villages where the wheel was not used—and yet this is the case.

Basically it is a matter of balancing out the risks involved against the benefits to be gained. The answer, for some of the largest and most respected corporations in this country, has been to begin African operations. Olin Mathieson, Gulf Oil, Chase Manhattan, Firestone and Kaiser Industries are a few of the U. S. firms who have entered African operations in earnest.

Throughout the African continent, two factors are generally lacking. The first of these is management experience and know how, and the second, perhaps more vital, is technical skill. One excellent measure of this lies in an example to be drawn from U. S. negotiations with Ghana on the Volta River hydroelectric project. Tremendously complex, the entire scheme includes damming and power development of the Volta River, and the eventual construction of the industrial facilities needed to process raw bauxite into aluminum within the African nation.

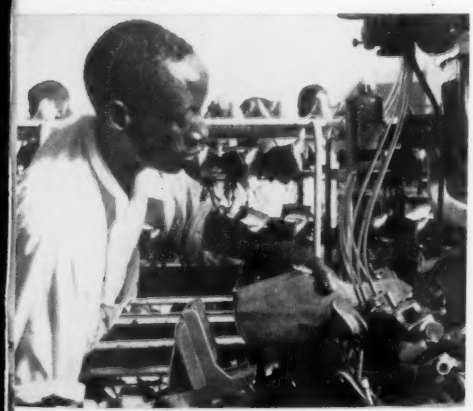
To set up this project, Chad Calhoun, a vice president with Kaiser Industries, has been negotiating directly with Kwame Nkrumah, prime minister of Ghana. The reason is that management skill in any real depth simply isn't yet developed in Ghana. Only the top men in the government really have the training to handle the intricacies of so involved a business deal. In time these abilities will be developed. Also, it is altogether likely that the management/technical skills will be developed largely through such cooperative working arrangements between Africans and Europeans (the term includes Americans as far as the African is concerned, incidentally).

THE responsibility that falls on the American who goes into Africa is perhaps best summed up in the words of Rep. Barratt O'Hara (D. Ill.), chairman of the Subcommittee on Africa on the House Foreign Affairs Committee. Speaking to Chad Calhoun, O'Hara summed it up this way: "I have heard you referred to as a representative of a new type of American businessman-



Above—A $28-million loan by the World Bank is providing the electric power to operate modern textile plants such as this one in Rhodesia. Such developments are going far to improve the lot of the individual African. Left—A native working on a floating dock in Mauritania, a smaller African nation, indicates how port development throughout the continent will open many previously inaccessible areas to trade and development.

Top—While much has been made of African racial problems, these are often not as bad as they appear. Here, Sengalese, French and Mauritanian workers work well together. Center—Mining is on of the major sources of natural wealth in Africa. Electric mining machinery has done much to improve the yield of mines such as this one, located in Southern Rhodesia. Below—This modern shoe plant in Southern Rhodesia is typical of many other newly born industries in Africa. One of the major problems is that of training Africans to handle the sort of work needed in such factories.



diplomat, and it seems a term aptly applied. I think it can be applied to the other witnesses at these hearings. I have been very much impressed by your testimony and the testimony of the other witnesses, pointing out the tremendous part American business has been and is playing in the development of Africa and establishing a partnership for mutual interest with the governments of the new nations."

Thus, for the engineer who would avail himself of the great opportunities of African business, it is in fact more than an engineering job. And taken separately, the engineering problems that can be encountered would be enough to give most engineers pause.

The following description of one engineering project is provided by Stanley DeJ. Osborne, president of the Olin Mathieson Chemical Corporation. His firm is working as one of the major partners in a consortium set up to exploit bauxite resources in Guinea. The name of the group of companies is FRIA, and this is the job:

"FRIA is located 61 air miles north of the chief port and capital city of Conarky (Guinea). To bring in the equipment, supplies and raw materials other than bauxite, and to transport the alumina to the coast for shipment to aluminum reduction plants in other countries, it was necessary to construct and operate a railroad from FRIA to Conarky, to build a 31-mile highway extension connecting the project area to the existing national road system, and to develop adequate port facilities to handle the resulting increased flow of traffic. At the plant site, where once stood but a few mud huts, FRIA has created a modern city to house about 7000 persons with all the ancillary facilities—schools, hospitals, a shopping center, an airfield, public utilities, recreation areas, and necessary local civic facilities. Virtually two-thirds of the total cost of the project (about $150-million total) was expended on these and other supporting facilities, most of which would have been provided in more highly developed countries by either private or governmental agencies. . . ."

The foregoing should give some idea of what *can* be involved in a full scale development program. To sum up the impact of so large an operation, these are the words of F. Taylor Ostrander, assistant to the chairman of the American Metal Climax Co., another U. S. firm active in Africa: "The copper companies . . . have set out to be the best employers of labor in Rhodesia. They deliberately set years ago a benevolent paternalism as their goal, and they have achieved this in full measure. Indeed, I have sometimes felt that the mining companies on the Copperbelt have a role in the lives of their employees and of the community that only the medieval church could equal. . . ."

Trying to generalize about all of Africa is about as safe as lumping California and Connecticut together because they are both in the United States—it simply can't be done. However, there are a few common denominators. These are lack of engineering skills, rich resources, and really sincere desire to add these together with an eye to economic growth. But to go much beyond that, one should first heed the words of J. W. Guider, engineer of mines for Bethlehem Steel:

"Africa cannot be treated as an entity, primarily because of the divergent conditions that exist in various parts of the continent. For instance, South Africa in certain parts is highly industrialized and the conditions under which the white engineer works are not unlike those that exist in the United States, except, of course, for the fact that manual work is performed by natives. On the other hand, in west Equatorial Africa, where I have had some experience and

where conditions are usually primitive, most engineering work is pioneering in nature, and very often done under most adverse conditions. There are many opportunities for engineers in Africa. However, again, the opportunities vary considerably depending upon local conditions. . . ."

In spite of this, there is one other generalization that would seem to hold true. Africa is an ambitious continent. Because it includes so many new nations, this ambition often shows up in the form of a rather naive, and at times destructive, nationalism. In other cases, the ambition has come to the surface in the form of a real desire for economic development. Often, tax holidays, tax laws favoring new business, and other incentives are offered to the firm that will go into Africa to aid in the realization of national ambitions.

For the engineer who may be considering the business possibilities of the Dark Continent, these factors are well worth bearing in mind. Further, because of fears of political or racial upheaval, steps are being taken to minimize the risk entailed due to these causes. Legislation in this country and, often, guarantees on the part of the African nation in question are available as protection for the investor or businessman in the developing nations.

Of course, all is not peril in Africa. It would be hard to find a more stable nation, or one that was better prepared in advance of its independence than Nigeria, most populous of the African nations. Nigeria is only one example. Liberia, long a close friend of the United States has a fine record of stability, dating from its independence in the 1800's.

To be sure, some concessions must be made by the American engineer of the American firm going into Africa. In most cases, the host country will insist on having some interest in the business. Because of the lack of highly educated or skilled Africans, the host country is often interested in having its own citizens trained for jobs of responsibility in an outside-sponsored venture. But in a sense these are positive factors, for if there is local interest in a business, it is much more likely to be looked on favorably by the local government and the population of the nation in question.

Perhaps one of the best measures of the ambitions of the Africans is the extent to which they are currently working to interest Americans in investing their skills and money. Many of the nations maintain offices in this country with that express purpose, and almost all are equipped to answer various specific questions through their embassies. Another measure is the flood of material that is sent to the U. S. Department of Commerce from Africa with an eye to building interest in African investment.

Certainly, the opportunities are attractive. While there are risks involved, there are continuing efforts to minimize these risks which are meeting with measurable success. Perhaps the individual engineer is at something of an advantage in considering the African Continent as a possible place to do business. On one hand engineers are in short, short supply in Africa. From the risk standpoint, the engineer's investment will be relatively small—as opposed to the multi-million dollar proposed Volta hydroelectric project, for instance.

The conclusion, then, would seem to be that the engineering firm which is considering expansion, and which does not rule out overseas expansion, might do well to look to tropical Africa. In the future, it is a sure thing that this continent will see what will perhaps turn out to be the most rapid and lucrative economic growth that has occurred in recent times.—**End.**

(Photos with this article by World Bank)

Below—The Niari Bridge, shown here under construction, is one of many which are gradually opening the interior of the African continent. Such developments make the continent more and more attractive to the investor and the engineer.

Above—Such taken-for-granted utilities as railroads are often needed very badly in Africa. These yards, in Nigeria, are part of a railway improvement program financed through a World Bank loan.

Below—The Kariba power project is in one sense symbolical of the tremendous hydroelectric potential that exists in Africa. Like many other African resources, power is largely untapped.

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

Election Results ►

Though Congress is in adjournment, the political pot continues to boil. Political pundits have been busily trying to analyze and interpret the significance of the recent elections in Texas, New York City, New Jersey and other local elections, and particularly how the results may effect the legislative program of the Administration in the next session of Congress. Although the election results were mixed, as usual, most opinion seems to be that President Kennedy's hand has been strengthened by the Democratic successes in the major contests, following the President's endorsement of his party's candidates in the key elections and his personal appearance on behalf of Judge Hughes for governor of New Jersey and Mayor Wagner for another term as mayor of New York City. Balancing off some of the political advantage derived from the elections, however, it is conceded that the Administration's position in the House (where most of its problems occurred this year) will be hurt by the absence of the firm and guiding hand of Speaker Sam Rayburn.

◄ *Anti-business Administration?*

The White House has been openly concerned about the feeling of the business community that the Administration is "anti-business". The President, and members of his Cabinet, have been making special efforts to offset this feeling among business leaders. In this connection, recent remarks of a prominent industrial leader, Mark W. Cresap, Jr., president of Westinghouse Electric Company, have stirred more than usual interest. The Westinghouse prexy told an audience of business executives that they must accept Government influence on the economy, and urged them "to work constructively within the new framework." Cresap said that the rise of large corporations made Government intervention in the economy inevitable. "Some businessmen manifest antagonism and disdain for almost everything government," he said. "They may prefer an era when Government left business alone, but they cannot resurrect that era. And I would not resurrect it if I could." In today's period of peril and challenge, Cresap added, "it would be imbecilic to engage in internecine warfare. Government is not the enemy of business; business is not the enemy of Government."

Engineering Under NSF ►

Additional emphasis will be given to basic research in engineering through establishment of an Engineering Section within the National Science Foundation. The new section, which replaces the Engineering Sciences Program office, will encompass a wide variety of programs in engineering research, the NSF stated. Dr. Alan T. Waterman, NSF director, said the new section will consider proposals for basic research in all fields of engineering. In addition to the fundamental engineering sciences, such as theoretical and applied mechanics, basic research areas such as those involving design and systems engineering will be supported. Special encouragement will be given in basic areas of national need, such as fire research and transportation. Dr. Samuel Seely, on leave from Case Institute of Technology where he is professor of electrical engineering, will head the new section.

◄ Reports from NSF

Other recent NSF announcements of interest to the engineering profession include:

— A Science Resources Planning Office in NSF has been established. It will serve as a focus for studies of the Nation's future needs and resources for research and education in science. Dr. Richard H. Bolt, on leave from M.I.T. where he was professor of acoustics, said the office he will head will cover both engineers and scientists who teach and do research and the products of science and technology.

— "Women in Scientific Careers" is a new NSF publication, covering data on training and employment of women in various scientific fields. Although women are becoming an ever larger proportion of the total labor force, science ranks far down on the list of professions they have entered. Only about four per cent of all federally employed scientists and engineers are women.

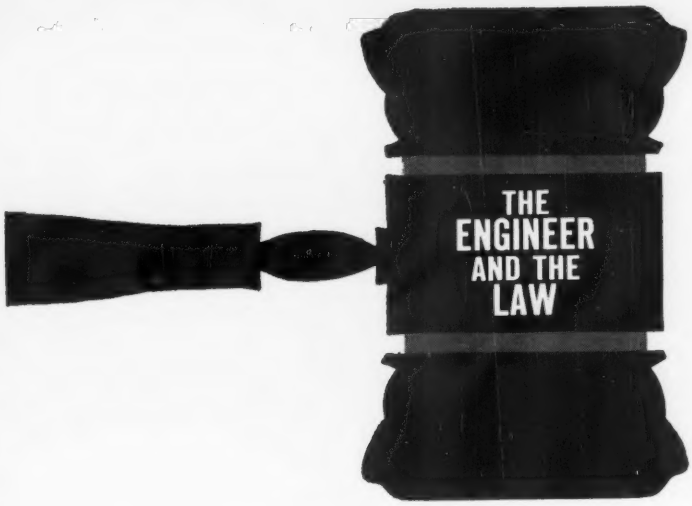
— Preliminary data on a 1960 survey of research and development shows private industrial firms accounted for $10.5 billion, a ten per cent increase over 1959. Of the total, 58 per cent was financed by the Federal Government. Another NSF report, "Scientific Research and Development of Nonprofit Organizations—Expenditures and Manpower, 1957," discloses expenditures for that year of $218 million, of which $111 million was devoted to basic research. The covered institutions reported employment of 7145 engineers and scientists, of whom more than 6000 were engaged in research and development.

Patent Rights ►

One of the hard fought issues for the next session of Congress will be over patent rights and ownership flowing from Government-financed research and development contracts. Vice Admiral H. G. Rickover has entered the fray through publication of his views by the Senate Judiciary Subcommittee on Patents following closed door testimony earlier in the year. The stormy petrel of the Navy was blunt in his views, as usual. He told the Subcommittee that ideas developed under Government contracts belong to the public and that Department of Defense policy to the contrary is wrong in that contracting firms are granted patents which give them a 17-year monopoly against 183 million Americans out of whose pockets come all public funds dispensed by the Defense Department. Since the testimony, however, the Defense Department has modified its policy, continuing the practice of turning the patents over to private companies, but retaining for the Government not only a license to use the inventions, but also a right to license other companies to use them. This is similar to the policy followed by the Space Agency. The Atomic Energy Commission, on the other hand, takes title to all inventions developed with Government funds unless it can be shown that the public interest requires some other disposition.

On the other side of the argument, industry spokesmen contend that Government ownership of patents is contrary to the free enterprise system and will hamper research and development operations, because companies will be less willing to undertake such work for the Government if they cannot anticipate reaping the commercial benefits of products or processes which may flow from the R&D operations. Rep. Emilio Q. Daddario of Connecticut states the case for this viewpoint in his argument: "When the Government . . . directs a company to turn talent loose on a problem, it is hiring a service. It receives the solution for which it pays; it should not then deny that team or that company the right to use the product of its own skill for commercial purposes."

Admiral Rickover made the additional point at the hearing that research companies require inventors among their employees to sign away their patent rights as a condition of employment. "But when the Government makes a research and development contract with the same company, the company claims that now everything is different. They say the Government can't do what the companies do; that it must let them have title to the inventions. This is the issue we are talking about. The companies want a double standard."



State Professional Corporation Laws and Corporate Practice

By MILTON F. LUNCH
NSPE Legislative Counsel

More than a dozen states have adopted laws which permit persons engaged in the practice of professions to organize and operate as a professional association or corporation. In both types of such state laws the group has the attributes and tax advantages of other corporations. The rather sudden emergence of such state laws followed a U.S. Court of Appeals decision holding that a group of doctors operating a clinic through an association could be treated as a corporation for tax purposes. But the state laws generally prohibit doctors, lawyers and some other professions from operating as a corporation, hence the new state laws are designed to permit utilization of the court ruling. Although the new state laws vary in detail they follow a consistent pattern in laying down stringent controls and limitations.

The engineering profession, long troubled by the corporate practice question, needs to examine these laws carefully before deciding whether they are the appropriate solution to that problem. Such an assumption has been made in some instances. The Illinois Legislature, for example, passed a state professional association law and a corporate practice amendment to the engineering registration law last session. The Illinois Governor vetoed the registration law amendment, however, on the ground that the professional association law covered the same subject matter and provided the same benefits.

There is serious question whether the new type of state law will adequately deal with the engineering corporate practice question. One of the standard limitations, for instance, is that the professional associations may not engage in more than one type of professional services. An architect-engineer firm, therefore, could not qualify unless it divided into two separate and distinct firms. The Ohio Attorney General has ruled that the new state professional association law constitutes an exemption to the provisions of the registration law which prohibits the forming of a corporation to practice professional engineering. But, he also ruled that the professional association of engineers is precluded from using a name involving the word, "engineer," or "engineering" or any modification or derivative of such term in its name.

The most difficult point in deciding whether the professional association-corporations laws are suitable to engineering practice occurs in connection with the requirement that all of the stock must be owned by members of the profession involved. In addition, only persons licensed in the profession may be officers, employees or agents of the association-corporation, but the term "employee" does not include clerks, secretaries, bookkeepers, technicians and other assistants. Under this language, every person in the firm designated as an engineer or actually performing engineering services for the firm would have to be registered, even though not a principal or part owner.

Even if consulting engineering firms could adjust to these conditions, there remains the fact that many large corporations perform engineering services as defined and covered by the state engineering registration laws. These companies, often with thousands of stockholders and a great variety of skills among employees and officers, most often perform engineering services in conjunction with other activities – construction, manufacturing, research and development, transportation, communication, etc. Such organizations obviously could not qualify under the association-corporation state laws. Consequently, the engineering profession must still consider the corporate practice question in its older form—as part of the state engineering registration law. The new type of law is permissive, not mandatory. It does not prohibit corporate practice of engineering as may be presently authorized in the state engineering registration law. It must be concluded, accordingly, that while the association-corporation approach may be useful for those consulting engineers who desire to utilize it, it does not resolve the engineering corporate practice question.

Some tax experts question whether this type of state law will be finally upheld as a means of achieving corporate tax status under the Internal Revenue Code despite the favorable ruling by lower courts. The Government has not yet appealed the issue to the Supreme Court, nor is it known what Congress might do on allowing the present rulings to stand in the contemplated general tax revision.

—End.

POLLUTED WATERS

A Challenge to P.E.'s

By

By HARRY G. HANSON, P.E.

Director

Robert A. Taft, Sanitary Engineering Center

THERE are few more satisfying pursuits in life than furthering the effective utilization and conservation of our natural resources—our water, air and land; our forests, crops and wildlife. This article will be devoted to one of these natural resources—water.

To engineers, generally, the importance of water is not new. The *management* of water, and more specifically *water quality*, in such a way that the water resources will contribute the most to the healthy growth of the Nation and to human enjoyment, is perhaps less well understood.

I should like to enumerate several of the factors bearing on this important objective, discuss them briefly and then explore how these factors may be fitted into a practical working arrangement for water quality management.

First, I will sketch the historical background briefly. Sanitary engineers have long been concerned with water and its quality. In fact, it has been their chief bread and butter preoccupation since the turn of the century. At that time we were just beginning to understand some of the grave consequences of misusing water. Typhoid fever, the dysenteries and cholera were plaguing our populations in city after city. Because raw sewage was being dumped indiscriminately into the same surface waters that downstream were the source of public water supplies and recreation; into the same estuaries from which oysters and other shellfish were being harvested.

Logically or illogically the first remedial measures were applied on the receiving end. The engineer devised water treatment capable of removing or destroying disease-producing bacteria. This water treatment consisted of settling (or flocculating and settling) and filtering out of the water suspended particles down to slightly less than the size of bacteria. As a factor of safety, chlorine was applied to kill any bacteria which might survive the settling and filtering processes. Later we added chemicals to remove hardness in water where necessary. These are the basic processes employed in water treatment today. I mention this because in a world of viruses, radioactivity, and soluble synthetic organic chemicals, this is not enough. Our modern water treatment plants were not designed to cope with these.

Concurrent with the development of water treatment to prevent disease, attention turned to the treatment of wastes. Attention was focused primarily on municipal sewage because of the disease implication. By the early thirties treatment processes had been developed for sewage and sewage-like wastes. These processes were capable of removing substantially all of the settleable solids, reduc-

ing significantly the finer suspended solids, the soluble organic material and bacterial populations. Where chlorination was added to the treatment, health hazards could be further greatly reduced.

By World War II, we were rolling at a good clip in the extension of sewers and the provision of sewage treatment. The treatment of industrial wastes, too, was receiving serious attention. It appeared that we were making real progress in the abatement of stream pollution, but this is about the closest in this century we have come to "breaking even."

World War II saw the real beginning of a technological revolution and population explosion, and because of material and manpower shortages for civilian requirements there was a great reduction in waste treatment plant construction. The accumulation of a backlog of needed waste treatment facilities continued into the post World War II period. By the fifties the situation was recognized as rapidly becoming serious. The first National Water Pollution Act was passed in 1948, but its provisions, not adequate in several respects, were not effectively implemented. Not until the last half of the fifties was there a more genuine "awakening" and a significant upward turn in the curve of progress.

Aid for the development of effective water pollution abatement programs was increased, support to universities and other research centers rose, basic data collection and better comprehensive planning emerged, and financial aid to cities for the construction of sewage treatment plants were initiated.

Shown here is a high head pumping station at the industrial water reservoir at Bethlehem Steel Company's Sparrows Point plant. The water comes through two pipe lines from the Baltimore city sewage disposal plant. The effluent from the plant is treated and processed at the plant before being pumped to Sparrows Point. Such sanitary precautions should be more widespread.

"Taking inventory" at the beginning of this decade, we find there is much to be done. We began the 1950 decade needing adequate sewage treatment for 60 million persons; we ended it needing adequate treatment for 48.5 million, nearly half of whom are still discharging raw sewage to streams. Information on industrial waste treatment needs are not as easily obtained, hence less complete. An estimate is that these needs are at least as great as the municipal needs. Nationally the level of construction of both municipal sewage and industrial waste treatment plants needs to be almost doubled, from $349 to $600 million for municipalities and at least a similar amount for industry.

The first challenge, then, is to catch up. There are multiple facets to this challenge: Financial, administrative, legal, socio-political as well as technical. If we somewhat paraphrase Einstein's "politics is more difficult than physics," we may venture that the technical problems we face may not be the most difficult ones.

Since almost every one is interested casually or less casually in money, we might look first at the financial factor. If an expenditure of $1.2 billion per year for the foreseeable future is going to be necessary to "catch up", where is the money going to come from and how is it going to come? The half that needs to come from municipalities will come out of taxpayers' pockets—yours and mine. It will come in the form of bond issues, revenue and other means. But it is not an easy matter to get bond issues passed, particularly for something that is as near the bottom of the municipal totem pole as sewage treatment. It is in competition with money for schools, roads, parks, hospitals, and a number of other things that are of direct daily use and benefit to local citizens. Sewage treatment benefits accrue downstream mostly, are not as visibly contributory to local convenience, comfort, and enjoyment, and thus are more easily put out of mind. Nevertheless, the responsibility of the community is the same as for other facilities. When you reside in a community downstream from a neighbor who is polluting your doorstep, you are particularly inclined to take this view of your neighbors' responsibility.

The distribution of costs between local, state and Federal governments is a matter of public policy. Some states have programs

of grant-in-aid to municipalities while others do not. Some believe the Federal government should share the responsibility, at least to the extent of providing stimulation grants-in-aid. You will play a part in determining the total pattern. One thing is clear—"The program needed in the sixties cannot be achieved with the present level of support." Such experts as Hollis and McCallum estimate, "The field will have to run three times as fast in the sixties as it did in the fifties, just to catch up." Associated with both the municipal and industrial treatment needs are problems of financing joint industry-municipal treatment facilities, multiple community facilities and public policy matters of the role enforcement will need to play.

Difficult as the problems of financing may be, the problem of arranging for joint action by multiple jurisdictions is sometimes even greater. The questions of choice between alternate plans of relinquishing autonomy, and of management of the facilities are often knotty and require both ingenious methodologies and skillful negotiation. Not only the legal aspects (Whose water it is and particularly whose waste water is it?), but also the socio-political ones are likely to come into active play. Some of the most difficult problems of communication and achievement of understanding face both public and private interests. I have reviewed quickly the nontechnical problems for which we badly need better approaches and methodology, and better means of achieving public understanding, participation and support.

As engineers the technical problems involved in meeting the challenge of water pollution may be of more immediate professional interest. These problems are not peculiar to the sanitary engineer, although he may have a primary role in adapting solutions to development and administration of public programs. They touch the power engineer, the navigation engineer, the industrial engineer, the oceanographic engineer, the hydraulics engineer and many others.

The main technical problems may be phrased as questions. ***First, can we account for all the wastes reaching our surface water resources?*** Water pollution normally is associated with sewage and industrial wastes. Only recently have we considered the growing pollutional effect of land drainage, particularly that from agricultural lands. Even more recently have we become aware of pollution resulting from chemical poisons deliberately applied to the water course to kill weeds, insect larvae, fish, and other forms of aquatic life. We thus have at least four major avenues through which manmade pollution may reach streams: Sewage, industrial wastes, land drainage, and direct chemical applications. A fifth, the underwater emission of motor exhausts, is just beginning to attract attention.

Thus, we have the major ledger entries. We encounter difficulty when we proceed with the accounting. First, we are able to account qualitatively and quantitatively for only one-third of the soluble organic constituents in the effluent from secondary sewage treatment. The situation with respect to industrial wastes is much worse. In the case of chemicals from land drainage and sources other than the easily located sewer, we can only play "blind man's bluff". Whose DDT is it?

About the Author . . .

Mr. Hanson

Harry G. Hanson, P.E., director of the Robert A. Taft Sanitary Engineering Center, received his B.S. in chemical engineering at North Dakota State College, Fargo, N.D. He later obtained a master's in sanitary engineering from Harvard. Beginning his career with the North Dakota State Department of Health as a sanitary engineer, he later became director of the State Division of Sanitary Engineering. He joined the Public Health Service in 1942, to later become executive officer of the branch known as the Communicable Disease Center. Transferred to the office of the Surgeon General in 1947, he achieved the title assistant chief engineer of the Public Health Service until he accepted his present position in 1954. He is a member of NSPE.

Can we predict the pollutional character of new wastes? Can we reasonably predict the effect of the waste on the dissolved oxygen of the stream; its toxic effect on fish and other aquatic life; its tainting effect on fish flesh; its possible damage to water treatment processes; its effect on water palatability; and its short or long term effect on persons who drink that water?

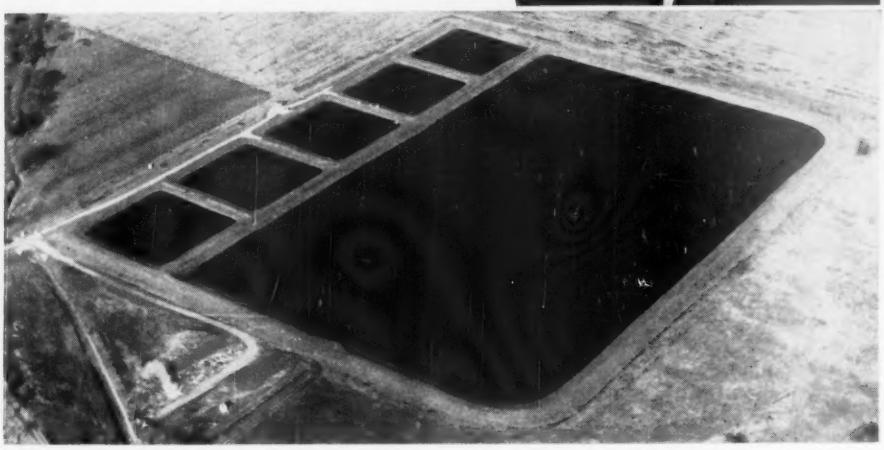
Our experience indicates that a well equipped and well staffed laboratory can obtain the information needed to predict with reasonable confidence a new waste's probable impact on certain important downstream water uses. However, the procedures are somewhat expensive and time-consuming and require good laboratories and competent staffs. Hence, the procedures available are little used. The toxicological phase of the study is perhaps its most perplexing aspect. The specialized services and cost necessary for determining the effect of repeated exposure to low concentrations of a waste for long periods of time would inevitably place this job out of reach of most public agencies. Equally discouraging, perhaps, is the probability that the toxicological study may take two years or longer. We urgently need a more economical and more sensitive procedure, a presumptive test, for prompt determination of a compound's potential for harming man. We hope our colleagues in the fields of physiology and toxicology accept this challenge.

Can we treat wastes adequately? Many yardsticks of waste strength and character are in use. Biochemical Oxygen Demand (BOD) is unquestionably the most common. With the best treatment processes available, a BOD reduction of approximately 95 per cent may be obtained. A reduction in BOD does not mean that the objectionable mineral salts—nitrates and phosphates—have been removed. The opposite effect is produced in secondary treatment—nitrates are increased. Many persistent organics discharged in sewage and in chemical industry wastes do not have an oxygen demand. They are either essentially non-oxidizable or they

(Continued on page 42)

Professional Profiles

Glen J. Hopkins, P.E., of Kansas City, Missouri, has spent his engineering career in the public service. Among his larger projects is one of the raw sewage lagoons in Missouri. His pioneering in this area has brought hundreds of similar lagoons to the Missouri Basin.



It is not unusual for a truly outstanding professional engineer to achieve some measure of recognition in his profession, for certainly it is a man's own profession that is best equipped to gauge the degree of professional attainment that he has reached.

On the other hand, it is perhaps a more distinctive honor for the engineer to be recognized outside of his profession by his entire community for the excellence of his work. Such are the honors that have been bestowed upon this month's Professional Profile personality, Glen J. Hopkins, P. E., of Kansas City, Mo.

This year, Hopkins was selected by the Kiwanis Council of Greater Kansas City for the honor of Federal Civil Servant of the Year, for contributing "most to the prestige of all Federal employees through exemplary work performance and outstanding community service."

In one sense, the award probably came as no surprise to many of the people who knew Hopkins, for his career has been one dedicated to public service. With the U. S. Public Health Service in Missouri, Hopkins pioneered the use of raw sewage lagoons, and encouraged their use in all states in the Missouri Basin. As a result of this pioneering effort, the several hundred installations of this kind in the Missouri Basin that now provide effective, efficient, but low cost sewage treatment—especially for smaller communities—are receiving world-wide attention.

Internationally, Hopkins has served as a consultant to the Kingdom of Jordan on water resource legislation at the request of the International Cooperation Administration. He is the author of current Jordanian law creating a Central Water Authority to carry out a comprehensive program of water resource conservation and development, and prescribing its responsibilities and duties.

A graduate of the University of Missouri (BSCE) and the University of Michigan (MS in both sanitary engineering and public health administration), Hopkins has worked as a conscientious and dedicated civil servant throughout his career. He is an ASCE Fellow, a Fellow and Life Member in the American Public Health Association, and a member of NSPE.

With so much to recommend him, it is little wonder that the citizens of Greater Kansas City saw fit to grant recognition to one of their most dedicated and productive civil servants.—**End.**

URBAN RENEWAL AND

The time-worn question of whether the chicken or the egg made the first appearance is dimmed these days in major metropolitan areas which have created a new variation on the old theme: Which comes first—the city planner or the highway engineer? Here are some specific examples of how the State of New Jersey has managed to coordinate these two basic urban perplexities.

AFTER many years of patient effort on the part of highway engineers in every state to locate and design highways through urban areas in the best interest of all residents, we suddenly hear a great clamor from various groups concerned with other aspects of urban redevelopment.

The complaint appears to be that engineers concerned with highway construction focus their attention solely on transportation—the safe and easy flow of people and goods from one area to another—without due regard for other equally valid objectives of city planners.

Is this a case of the cart before the horse? Should highway officials wait for the planners to agree on an ideal combination of residential, commercial and industrial areas, parks, playgrounds and schools, and the many other requirements of urban life before fixing the location of the modern express roads which are a well recognized necessity in any congested and growing community?

In New Jersey, the most densely populated state in the nation, we have not allowed this "conflict of interest" to become a major problem. We have recognized that the objectives of city planners and highway engineers are intertwined to such an extent that they are inseparable.

Cooperation with local officials has been based upon mutual realization that existing conditions in our urban areas, as evidenced by the tremendous swing to suburban living, are clearly the result of inadequate transportation facilities. The logical conclusion is inescapable—deteriorating urban areas which are laboriously and expensively redeveloped from the standpoint of housing or industry alone, without properly located and designed transportation facilities, will not require too many years to sink back into a slough of despondency and decay.

Robert H. Pease, when asked what importance he attached to good transportation in appraising a city, an area or even a property, stated, "Transportation is equal with shopping and schools as the three corner stones on which real estate values are built. Transportation is what makes a city. Mortgage people are reluctant to make loans on property that is not served by good transportation." Who, then, is better equipped to determine these transportation facilities?

The solution to the over-all problem of urban renewal lies in the pooling of many skills. The highway industry, faced with infinite variations on the theme of harmonizing functional and esthetic values, has over the past many

HIGHWAY ENGINEERING

By

O. H. FRITZSCHE, P.E.

State Highway Engineer
State of New Jersey

years perfected the techniques such tasks require.

There is no other group of professional men better versed or trained in the collection and analysis of the basic facts needed in the planning of transportation and related facilities necessary to over-all planning.

When this training and profound background knowledge is pooled with that of the urban planner, the industrial redevelopment expert, the sociologist, and all of the other professional men involved in the effort to save our urban areas, the best type of planning presently available results.

Why is it then, that at the Hartford Conference in September, 1957, it was suggested that the national effort to bring our highways up to present and future transportation needs be delayed two whole years so that the urban planners could develop their ideas? This suggestion could not be based on any factual knowledge of what highway engineers, as individuals and as a group, have been and are doing every day to combat urban deterioration.

A conference sponsored by the Highway Research Board, the American Association of State Highway Officials and Syracuse University, with a grant from the Automotive Safety Foundation, was held at Syracuse University's Sagamore Center almost three years ago which had for its main purpose creation of a guide to be followed by the various state highway departments. Since then, AASHO has held a series of planning seminars throughout the country to alert and indoctrinate highway engineers to the development of techniques on urban problems and their importance. Presently the American Association of State Highway Officials has established a committee on urban transportation planning to develop criteria for relating transportation to land use and development on a scientific basis.

EVEN before all of this was initiated, we in New Jersey were faced with urban problems under the less fancy nomenclature of "slum clearance" and "housing". It was the highway engineer's responsibility, oftener than not, to aid in municipal planning. Local officials realized that for them to undertake collection and analysis of the necessary factual data would have set them back 18 to 20 years, to the point where the highway engineer stood when he began his first transportation study.

The New Jersey Highway Department, anticipating problems in highway engineering and construction because of the lack of sound planning in all areas, encouraged the formation of planning boards throughout the state in 1948.

We also adopted a policy of

contacting local officials and planning boards before beginning location studies for new highways. In this way, local problems are discussed and local needs considered during the studies so that better service can be afforded the municipalities affected by new construction.

This contact is continued all during the study, with the result that the problems of both the state and the locality are thoroughly understood, and if possible solved or compromised. Through these conferences many of the objections normal to a public hearing are overcome, generally leaving only minor objections and those of property owners whose homes will be taken, to be considered.

At the present time there has been excellent team work in all cases where full time directors are employed by local planning boards. These officials are thoroughly cognizant of their obligations and have worked hard in acting as intermediaries between the highway department and the local officials.

As an example of how this works to the benefit of all, the City of New Brunswick was faced with a problem of slum clearance in 1951 before a park could be established along the Raritan River. Further development was planned from the river toward the center of the city.

Since the highway department contemplated an improvement in the area we, as is our practice, met with the city officials to describe our objectives and to see how we could coordinate our plans with those of New Brunswick. These meetings resulted in an agreement whereby the highway department acquired all the property needed for both the new highway and the park development, as well as the construction of a new Municipal Public Safety headquarters building. The city in turn paid its share for the lands required by it to the department.

Through the years New Brunswick has cleared the remaining properties toward the city center and is now proposing development of the area as a shopping and business center with central parking facilities.

Because we have always felt that redevelopment of any area without proper entrances and exits would only help history to repeat itself and result in the area becoming depressed all over again, we are still collaborating with the officials of New Brunswick to develop proper circulation in the area and assure the permanency of the investment. The same collaboration was developed in Newark with the Housing Authority in 1955.

On a broader scale, the Pennsylvania Department of Highways and the New Jersey State Highway Department, with participation from Philadelphia and its surrounding counties, the Bureau of Public Roads and the New Jersey counties of Camden, Gloucester, Burlington and Mercer are now conducting a transportation survey which includes all phases of transportation and includes land use studies with sociological factors given thorough analysis. This field work is practically completed. The remainder of the project involves analysis of material collected and recommendations for improvements.

Now plans are being developed for an eight–county Northeast New Jersey study covering Bergen, Passaic, Hudson, Essex, Union, Middlesex, Morris and part of Somerset Counties.

This study of the densely populated urban area of New Jersey will be carried over a three-year period at an estimated cost of $3,500,000, distributed as follows: $2,300,000—U. S. Bureau of Public Roads; $800,000—New Jersey State Highway Department, and $400,000 divided on a per capita basis among the eight counties.

The objective of this study will be to obtain data calculated to place in the hands of the engineers and planners basic statistical facts for the intelligent future development of this metropolitan area.

Since New Jersey has the unique distinction of being the only state highway department with a division of railroads, its objectives must be widened to include the safe and efficient movement of people and goods by rail as well as rubber. To this end, the Northeast New

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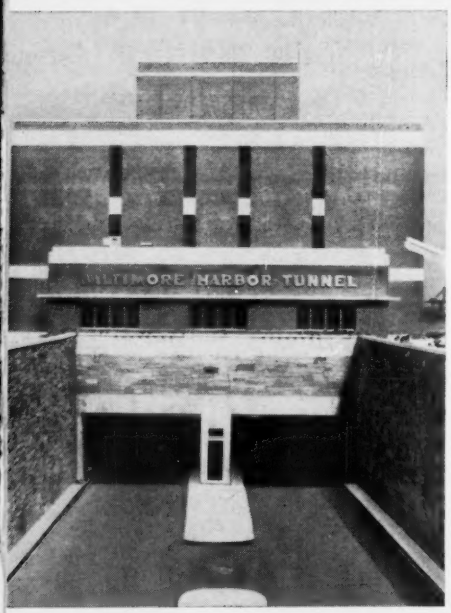
About the Author . . .

Mr. Fritzsche

Otto H. Fritzsche, P.E., an engineering graduate of Lehigh University, joined the New Jersey State Highway Department 36 years ago and was made State Highway Engineer in 1956, directly responsible to the State Highway Commissioner for all phases of location, design and construction of state highways. He is now serving as president of the Association of Highway Officials of the North Atlantic States. Among his many awards have been the "Career Merit Award" of the New Jersey Association of Chosen Freeholders, and the 1961 "Engineer of the Year" award of the New Jersey Society of Professional Engineers, of which he is a member.



Above left—The undeveloped and blighted riverfront area of New Brunswick as it appeared when the New Jersey State Highway Department construction got underway in 1954 showed slum structures bordering narrow streets. Above right—Riverfront New Brunswick as it appears today. Park lands are to the right and new apartment units have taken the place of former squalid dwellings and economically wasted land.

Left—The Baltimore Harbor Tunnel and the approaches to it (shown below) over the Harbor Tunnel throughway are an example of the immense size of a project to improve the flow of traffic through a city. Almost a decade of actual planning and construction went into building the trench type tunnel, fifth longest of its kind in the world.

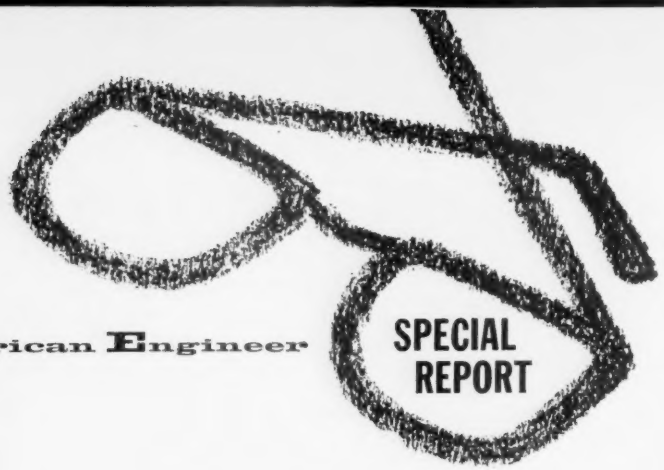
Jersey Study will include the many problems of rapid transit. It is hoped that this study will provide statistical data which might point the way toward solving the critical problems now facing New Jersey commuters and the railroads.

To assure itself that this study will not take the course of many previous efforts and become a one shot, soon obsolete affair, the highway department intends to establish a group within its Bureau of Planning and Traffic which will have full knowledge of the original survey and be in a position to periodically continue the collection of data to accommodate changing times and conditions.

To date we have established and received Federal approval of Interstate routes through the urban areas of Bergen and Passaic Counties, Essex and Union, Camden, Middlesex and Somerset Counties. Curiously, our greatest opposition was raised in Essex County. Here location was conscientiously made to conform to municipal plans and no one objected to the alignment. Rather, the opposition was to the profile of the highway which was based on costs, as required by Federal conditions. In this case the problem was solved by finding the necessary funds to depress all but two thousand feet of this seven and one half mile section of the highway.

The over-all problem of urban renewal is made difficult only by those few who fail to recognize that it exists and by many who recognize the problem but fail to admit that some phases of it are beyond the capabilities of their own fields of specialization.

The solution of the urban problem requires very much the same technique as was applied to the problem of controlling the atom. Just as the first conversion of the atom's tremendous disruptive power to a controlled force was accomplished by experts trained in many different disciplines working together, so can the accelerating decay of urban areas be halted and reversed. Economically, the degeneration of our cities is just as destructive as an uncontrolled atomic reaction. It just takes longer to appreciate the result.—**End.**



Office of Civil Defense Offers Course on Fallout Shelters for Engineers

In this nuclear age, professional architects and engineers throughout the country should have a thorough knowledge of the fundamentals and newly developed techniques of fallout shelter design and analysis. This is of utmost importance to enable them to include adequate fallout protective features in new building construction at reasonable costs."

With this objective in mind, the Office of Civil Defense, Department of Defense, has launched a two-pronged program to help professional engineers and architects deal with the technical problems in the much emphasized fallout shelter activity. A series of two-week "Fallout Shelter Analysis" courses are now underway and will be conducted through the Spring of 1962 at ten schools:

Worcester Polytechnic Institute, Worcester, Mass.

University of Florida, Gainesville, Fla.

University of Michigan, Ann Arbor, Mich.

University of Illinois, Urbana, Ill.

University of Colorado, Boulder, Colo.

University of Washington, Seattle, Wash.

University of California, Berkeley, Calif.

Oklahoma State University, Stillwater, Okla.

U. S. Army Engineer School, Ft. Belvoir, Va.

U. S. Navy Civil Engineers Corps Officers School, Port Hueneme, Calif.

First priority for the courses will be given to engineers and architects of firms who indicate an interest in participating in the nation-wide shelter survey. Following successful completion of the course, the firms represented may be requested to participate in the survey on a contract basis under usual professional negotiation procedures. The first priority phase is being handled by the district offices of the Army's Corps of Engineers and the Navy's Bureau of Yards and Docks. Applications should be submitted directly to the appropriate local office as shown in the list at the end of this report. The following information is required: name, title, firm, business address, business phone, residence address, residence phone, professional branch, professional license designation, state(s) in which licensed. The application letter should also contain any special qualifications or justification to support the request to participate.

There will be no fee or tuition for the courses, but the Government will not pay other expenses. An appropriate certificate of proficiency in Fallout Shelter Analysis will be issued by the Department of Defense upon successful completion of the course.

The second priority phase embraces the same rules and procedures, except that it is designed for those who do not desire to participate in the shelter survey, but who want to take the course for their own professional information and as an aid in designing fallout shelters for private clients. Applicants in this category should furnish the same information to the regional office of OCD for their state. These regions and the states serviced are: Region (1)—Oak Hill Road, Harvard, Mass.—Maine, New Hampshire, Vermont, New York, Mass., Connecticut, Rhode Island, N. J.; (2)—Olney, Md.—Pennsylvania, Ohio, Kentucky, Virginia, West Virginia, Maryland, Delaware, District of Columbia; (3)—P.O. Box 108, Thomasville, Ga.—Tennessee, N. Carolina, S. Carolina, Georgia, Alabama, Mississippi, Florida; (4)—Battle Creek, Mich.—Minnesota, Wisconsin, Michigan, Illinois, Indiana; (5)—P.O. Box 2935, University Hill Sta., Denton, Texas—New Mexico, Oklahoma, Texas, Arkansas, Louisiana; (6)—Denver Federal Center Building 50, Denver 25, Colo.—N. Dakota, S. Dakota, Wyoming, Nebraska, Colorado, Kansas, Iowa, Missouri; (7)—Naval Auxiliary Air Station, Santa Rosa, Calif.—California, Nevada, Utah, Arizona, Hawaii; (8)—Everett, Wash.—Washington, Montana, Oregon, Idaho, Alaska.

Present unofficial estimates are that approximately 1000 consulting firms will be retained to conduct the fallout shelter surveys. Pilot training surveys are now being conducted in Baltimore, Md., and White Plains, N.Y. The results of this experience will undoubtedly affect plans and techniques for the balance of the $93,000,000 shelter survey. It is anticipated that the Department of Defense will make recommendations to Congress early next year for additional funds and authority to complete the nation-wide survey by the target date of December, 1962. Approximately 1600 spaces have been reserved in the courses for practicing engineers and architects in addition to those who will be engaged directly in the survey.

In requesting the cooperation of NSPE and other professional societies on the shelter program, the Defense Department stated that "a close working relationship must

(Continued on page 46)

I Vote "AYE"

This article by a member of NSPE's Inter-Society Relations Committee is the second in a series which will discuss pros, cons, and various aspects of the newly proposed changes in the Society's membership requirements.

ALEX VAN PRAAG, P.E.
Past NSPE President

By its formal action, the Board of Directors of NSPE, meeting in Roanoke, Virginia, on October 19th, authorized a full membership vote on the question of adding a new grade of membership to be termed "Engineer Member". A membership ballot is expected to be taken in January, 1962. The membership vote is accomplished through a ballot on a change in the Society's Constitution, thereby authorizing the additional grade of membership. On this issue, I vote "aye".

This proposed change in membership is, in my opinion, a far step forward in bringing about more unity within, and a better organization of, the profession of engineering.

Reluctantly, I discuss this subject now in a printed presentation. The reasons for my reluctance should be obvious to all. Admittedly, I am fully aware of the very many prior presentations through public appearances, publications, pro and con Society protestations, and other offerings and urgings in behalf of a more unified and better organized profession of engineering. On the other hand, the proposal to now expand the NSPE membership is potentially such a forward and realistic step in bringing about a better organization of the engineering profession that I must wholeheartedly express my favorable sentiment relative to the voting.

More than ten years of practically continuous and aggressive effort for and on behalf of the progress of NSPE, and in earnest endeavor to bring about a more unified and useful profession, have taught me that the reward of effort comes slowly but that the results of earnest effort and endeavor are ultimately rewarding. Why do I say this?

We are making progress in bringing all professional engineering organizations and all professional engineers into support of an overall organizational pattern which can ultimately provide "the voice of the profession". Let me cite only one or two illustrations—more could be quoted.

During the years of 1949 and 1950, a so-called Exploratory Committee, made up of representatives from fifteen national engineering societies, sought to develop a single authoritative voice for the profession. The efforts of this Exploratory group, if accomplishing nothing else, emphasized the importance of the subject. The outcome of these discussions and the recommendations of this joint committee were not acceptable to the profession. The meetings of the Committee were, however, a stimulus to continued efforts in the direction of the Committee's effort.

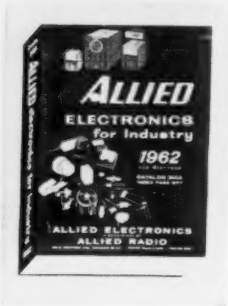
In more recent years, the American Institute of Electrical Engineers (AIEE) has urged a division of the areas of responsibility of the many engineering societies under a three-fold leadership pattern. Subsequently, it was proposed that there be a further committee guiding and coordinating at high level the activities of the three named groups. This three-group proposed plan was generally referred to as the functional plan, better called the functional concept. Under this arrangement of division of responsibilities and areas of activity, the Engineers Joint Council (EJC), the Engineers Council for Professional Development (ECPD), and the National Society of Professional Engineers (NSPE) would each assume appropriate functional leaderships. Under this concept, all members of the profession would be expected to participate and to hold membership in (1) a principal technical society representing the individual's principal interest in engineering, and (2) a professional society, for example, the National Society of Professional Engineers, representing his professional interests. While not fully accepted by all of the major and engineering societies, this concept has sufficient merit, and sufficient acceptance in the profession, that it is slowly but surely being implemented and effected. This concept has very strong support at the membership level. This is progress in no small measure.

In the evolution of time, and in support of the functional concept, the president and vice president of EJC, ECPD and NSPE are holding regularly scheduled discussion meetings. These meetings are expected to bring the three agencies into much closer cooperation and to lead to a more effective use of the powers and the talents of the named organizations in the furtherance of the aims and objectives of the functional concept. This discussion group can and should give inspired leadership to the profession and thereby further the effort toward a better organized and more effective profession, and thereby, too, render a great service to all society. Doubtless, future

(Continued on page 52)

New Literature

INDUSTRIAL CATALOG – Allied Electronics Corporation, a wholly owned subsidiary of Allied Radio



Corp. has announced the release of a 592-page, 1962 catalog, largest in Allied's 41-year history as an electronic parts distributor to industrial and consumer markets. All items are listed at factory prices with the same quantity discounts offered by the original equipment manufacturer. Off-the-shelf delivery on the same day order is received is provided. New with the 1962 catalog is the special 13-page directory of semiconductors designed to facilitate ordering. Hundreds of pages are devoted to detailed listings of semiconductors, connectors, capacitors, resistors, relays, plugs transformers, special purpose tubes, meters, cables, nuvistors, thermistors, counters, motors, power supplies, and other industrial electronic products. Among the many items of wide industrial application are public address systems for indoor and outdoor paging and plant-wide communications. The Allied line of some 90 Knight-Kits is highlighted by two newly developed units for critical laboratory applications—a 5" DC Lab Scope with choice of plug-in interchangeable vertical amplifiers; and an AC VTVM with self-seeking motor-driven range selector that automatically selects the proper range when the probe is touched to the circuit under test. Among the other features of the new catalog are leading tape recorders and accessories, a special selection of stereophonic records and tape recordings and a complete technical book section.

(Circle 15 in Readers' Service Dept.)

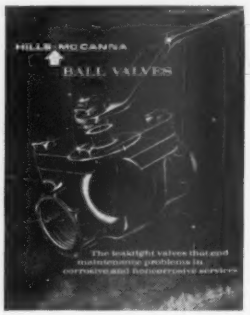
JACKING SYSTEMS—Elwood equipment Corporation has published several "tab card sheets" which describe some of the heavy jacking jobs using Elwood jacking equipment. Fact sheets are also available, but for a quick study of how to put such equipment to use these tab card sheets show the scope of jobs which can be handled by giving specific examples with the specifications of the problem that existed, equipment used, and the method of operation. Pipe pushing, erection, tunnel shields, underpinning, slipform, house moving, post tensioning, automatic pile testing and prestressing-erection are some of the jobs described.

(Circle 16 in Readers' Service Dept.)

INDUSTRIAL WASTE – According to the new Industrial Waste Treatment Guide just issued by B-I-F Industries, the growth of waste treatment plants has not kept pace with the growth of the pollution load. It has been estimated that 7000 new treatment plans will be required by 1970 and that expenditure for this problem will be nearly double what it was in 1960. The new, 16-page Engineering Data Bulletin deals with the problems of waste treatment, classification of wastes and the methods of solving these problems. Four general classes of waste for food, mineral products, chemical processing and general industry, with their characteristics and strengths, are discussed. Equipment and processes used in unit treatment are detailed, including tanks, filters, aerators, chlorine gas feeders, vacuum filters, incinerators, sludge collecting and pumping equipment, and many others. The Engineering Data lists special applications where B-I-F equipment is utilized in the operation and control of unit waste treatment processes. Classification, process and equipment tables, illustrations, schematics and a list of applicable B-I-F equipment are included in the Engineering Data.

(Circle 17 in Readers' Service Dept.)

BALL VALVES—A new catalog, No. 1200-A, provides detailed information on the complete line of manually and



pneumatically operated ball valves manufactured by Hills-McCanna Company. Valves described range in size from ¼" through 12" with screwed, socket weld, and flanged end models for temperatures from minus 150° to 1000° F, pressures to 1000 psig, and vacuum to 10^{-6} mm Hg. Two basic types of valves catalogued are: the McCannaseal, a top entry valve which permits maintenance without removing the body from the line; and the McCannaflo, a valve with one-piece bar stock body and end adapters. Standard body materials are listed. Two new types of ball valve seals are presented for the first time: the Graphitar seat for up to 1000°F service; and "Fire-Seal" seat with Teflon or reinforced Teflon encaged in accurately machined metal secondary seats. Pneumatic operators for automatic and remote on/off operation are described and illustrated. Dimensions and weights, material specifications, typical values, pressure-temperature rating charts, and a complete page of detailed ordering instructions enable the user to select valves directly from the catalog.

(Circle 18 in Readers' Service Dept.)

DATA SHEETS—A new price list and index of engineering and business data sheets, data books, binders, filling equipment and Lefax forms has been published by Lefax in handy pocket-

sized booklet form. Lefax supplies practical loose leaf reference data to students, engineers, technical workers, and business men throughout the world. Information in their pocket-sized tables is gathered from technical journals, engineering handbooks, textbooks, trade magazines written by men of authority. The information is boiled down to essentials and carefully checked for errors. The sheets are designed to be filed alphabetically, numerically, or by code. Subjects range from metric conversion tables and methods of engineering to business law and hints on technical writing. Described in their booklet on forms are the Lefax forms for almost any kind of engineering or general office need.

(Circle 19 in Readers' Service Dept.)

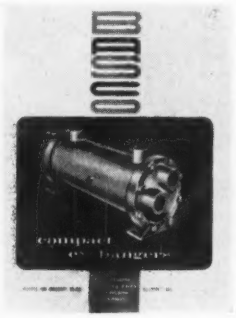
OUTDOOR LIGHTING—A new series of four bulletins describing outdoor lighting transformers and their applications is available from Jefferson Electric Company. Described as a new 20-page catalog of transformers for outdoor incandescent and outdoor mercury-vapor lighting, the series includes brochures on 100-, 175-, 250-, 400-, 700-, and 1000-watt mercury-vapor lamp transformers and a bulletin on transformers for use in series circuit incandescent lighting. The brochures contain complete wiring diagrams plus physical and electrical specifications for all transformers, including constant wattage and series circuit types.

(Circle 20 in Readers' Service Dept.)

POWER SYSTEMS—Bulletin No. 83, "Feedrail Motor Driven Electric Power Systems," describes electric power outlets whose movement can be synchronized with the movement of a conveyor for mass production assembly and electrical testing. Such steps of the manufacturing process as continuity checks, alignment, cold test runs, watt tests, motor speed measurements, etc., can be performed "on the move," eliminating the extra handling and bottlenecks that occur with fixed stations in the assembly or testing operations.

(Circle 21 in Readers' Service Dept.)

HEAT EXCHANGER—Basco, Inc. provides complete information on a line of stock model compact heat ex-



changers in a new illustrated four-page bulletin just released. The bulletin describes a number of new construction features providing improved performance and reliability over a wide variety of applications. Standard sizes, dimensions, and weights are listed for one, two and four-pass exchangers with shell diameters from 3¼" through 8¼" and lengths from 1' 4¾" through 6' 7".

(Circle 22 in Readers' Service Dept.)

HITEMP CATALOG—Hitemp Wires Co. has announced that their new catalog is off the press and available for distribution. This new 58-page catalog is a complete compendium of Hitemp's product lines. Within its 29 sections are synopses of government and commercial specifications, new product highlights, easy reference tabulations on applicable military specifications, U. L. listings and ratings, physical dimensions, dielectric strength and temperature ratings for the company's magnet wire, Teflon wrapped and extruded hook up wire, miniature Teflon lead wire, Teflon tubing, cables FEP insulated wire, Teflon tape, marking fluids, special jackets, etc.

(Circle 23 in Readers' Service Dept.)

PROGRAM CONTROLLERS—The Tenor Company, a division of Milwaukee Chaplet and Manufacturing Co., has published a new booklet describing a series of program controllers and timing devices designed to save a great deal of engineering time usually involved in process systems or control of operations. The Tenor Controller is a completely packaged unit and the design engineer using it need only concern himself with the sensing elements and the functions to be controlled rather than with the method of controlling the system which he is required to set up. The Tenor Controller is designed to automatically: sequence numerous operations in a system; switch from one series to another; reinitiate repetitive operations; step from one series of predetermined functions to another until a process has been completed; tie together various accuating functions of a system; and speed operations.

(Circle 24 in Readers' Service Dept.)

SEALING BROCHURE—Stillman Rubber Company, manufacturer of metal and rubber seals and gaskets, has announced the availability of a new, comprehensive brochure. Titled "Specialists In Sealing," this new, eight-page brochure thoroughly describes the diversified line of products which are designed and manufactured by Stillman. It covers the history of the organization, mentions some of the customers, and goes into detail on the six major product lines which have made Stillman well known in industry. In addition, this brochure shows graphically the modern, up-to-date laboratories and facilities of the company and explains the technological progress that has been achieved in less than fifteen years.

(Circle 25 in Readers' Service Dept.)

BAR RUST—The Harrison Paint and Varnish Co., Midland Industrial Division, has published an eight-page brochure entitled "Bar Rust" describing protective coatings for metals. Each Hy Spar bar rust primer is listed with its features, uses and the following specifications: finish, color, drying time for set and recoat, coverage, application method, and thinning. Included is a color sample chart. And additional aids are brief descriptions of how to estimate paint requirements for structural steel and the proper preparation of surfaces to be protected.

(Circle 26 in Readers' Service Dept.)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in these columns, merely circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

TV Spot Films, Slides Ready for Engineers' Week

Morgan Beatty, veteran NBC news commentator, will narrate four of the 20-second TV spot announcements produced for the 1962 National Engineers' Week. Mr. Beatty's voice will be heard on films depicting a wheeless vehicle riding on a cushion of compressed air, surface travel on the moon, high-temperature cloth, and a civil engineering office. A fifth film in the series of five available for the 1962 Week will be narrated by Major General A. M. Minton, director of civil engineering for the Air Force. The set of five TV spot films may be ordered from NSPE for $25.

A set of seven metal-mounted glass slides, illustrated on this page, may be ordered for $10 per set. The slides can be used during regular TV station breaks during the Week of February 18-24. Both the slides and the films are centered around the theme of the 1962 Week—"Economic Growth Through Professional Engineering."

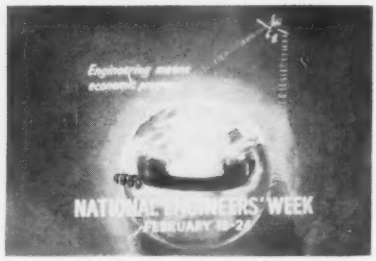
Logotypes

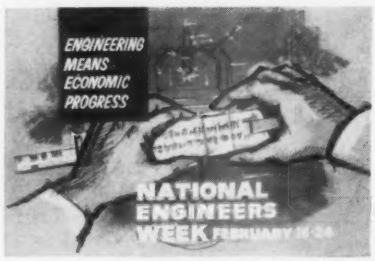
Logotypes carrying this design for the 1962 National Engineers' Week are available from NSPE headquarters. The type-high metal cuts are ready for insertion in printing forms.

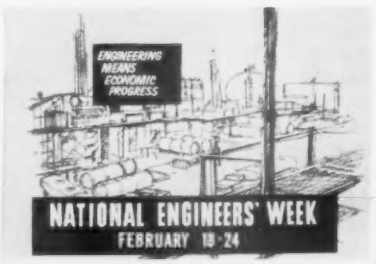
Pitney-Bowes postage meter ad plates calling attention to National Engineers' Week are available this year. The Model R plates may be ordered for $15, and the smaller DM plate for $10. Orders for these should be placed this month.

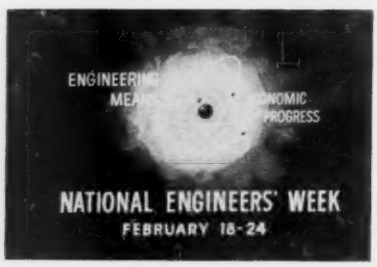
A limited supply of Engineers' Week promotional kits are still on hand at the NSPE headquarters. The kits contain sample posters, banners, gummed seals, bumper stickers, and other aids, along with printed matter suggesting a basic Engineers' Week program. This material is enclosed in a plastic, zippered brief case. The case, on which the PE emblem is printed, may be used throughout the year for other professional society committe work.

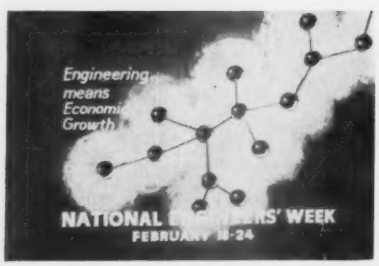
Mailings concerning the 12th annual observance of National Engineers' Week were made this month to engineering executives in industry, newspaper publishers, engineering publication editors, and consulting engineering offices. These mailings call attention to the 1962 Week, February 18-24, and suggest that local Engineers' Week chairmen be contacted for specific details regarding participation in such things as career conferences, guided tours, displays, and the like.

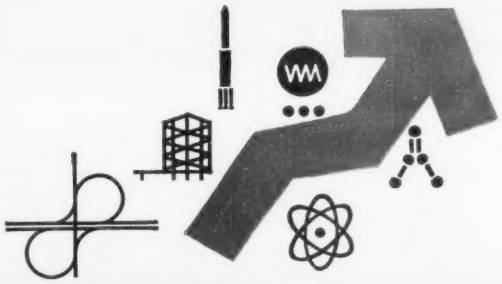












PROMOTIONAL AIDS FOR NATIONAL ENGINEERS' WEEK

Here are the basic promotional aids on which to build your Engineers' Week program. These items will give your program coverage in local newspapers, on radio and TV stations, and in civic and group displays. Use these promotional materials to emphasize engineering and economic growth.

1 **TV Spot Films:** A set of five 20-second TV films dramatizing the theme of the 1962 National Engineers' Week. Produced to meet network standards, the films call attention to the contributions of engineering to our national economic growth. Each film qualified for public service TV time during station breaks. A set of these five films will reach your largest Engineers' Week audience. Price: Set of five films, $25.

2 **Set of Seven TV Slides:** Obtain extensive TV coverage through the Week with these slides displaying poster-type art work and printed copy calling attention to engineering. May be used during all TV station breaks as public service announcements. Price: $10 per set of seven slides.

3 **Tape Recorded Radio Announcements:** A set of seven 20-second radio spot announcements, made by a network radio and TV announcer. Offers local station a top-level recording for 20-second station breaks. Price: Set of seven recorded announcements, $3.50.

4 **Postage Meter Plate:** Pitney-Bowes postage meter ad plate which imprints National Engineers' Week and the theme on first class mailings. Two meter model sizes: R (regular), and DM (desk model). Prices: Model R plate, $15; Model DM plate, $10.

5 **Posters:** Colorful 9x11-inch pasteboard posters carrying the 1962 Engineers' Week design and theme. This is the basic promotional item for calling attention to the Week. Use on bulletin boards, in window displays, school exhibits, etc. Large size (18x22 inches) also available. Prices: 9x11, $4 per 100; 18x22, $5 per 100.

6 **Paper Banners:** Excellent for display use. Three feet long by 6 inches wide. Has poster design and words "National Engineers' Week" in color. Price: $4 per 100.

7 **Bumper Stickers:** Gummed paper stickers, 15x3¾-inch carrying the words National Engineers' Week and a reproduction of the professional engineer's seal, in bright yellow on a black background. Prices: 100 to 500—15¢ each; 500 to 1,000—10¢; 1,000 to 3,000—7¢; 3,000 to 5,000—5¢; and over 5,000—4¢.

8 **National Engineers' Week Seals:** Use these brightly colored seals on all office mail from now through February 24. Poster design printed on 1½-inch gummed paper. Price: $3 per 1,000.

9 **Newspaper mat story on how engineering contributes to national economic growth:** A feature article describing how engineering knowledge and skill becomes the basis for increased job opportunity. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75¢ each.

10 **Newspaper mat story on outstanding engineering accomplishments of the 20th Century:** A feature article listing and describing some of the engineering achievements which have brought us into the new era of rapidly expanding technology. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75¢ each.

11 **Newspaper mat story on engineering and science:** A feature article explaining the chief differences between basic science and engineering. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75¢ each.

12 **Logotype:** A metal cut of a poster design to insert in advertising, special sections of newspapers, industrial house organs, magazines, and other printed matter. All state society and chapter publications should have one. Price: $1 each.

USE THIS COUPON TO ORDER YOUR AIDS NOW!

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2.....TV slides: set of 7 slides @ $10 per set.
3.....Recorded spot announcement @ $3.50 per set.
4.....Postage meter plates: Model R @ $15 ea.; Model DM @ $10 ea.
5.....Posters: regular size @ $4 per 100.
Posters: large size @ $5 per 100.
6.....Banners @ $4 per 100.
7.....Bumper stickers: 100–500 @ 15¢ ea.; 500–1,000 @ 10¢ ea.; 1,000–3,000 @ 7¢ ea.; 3,000–5,000 @ 5¢ ea.; over 5,000 @ 4¢ ea.
8.....Seals @ $3 per 1,000
9.....Logotypes @ $1 ea.
10.....Newspaper mat stories on engineering and economic growth @ 75¢ ea.
11.....Newspaper mat stories on outstanding engineering accomplishments @ 75¢ ea.
12.....Newspaper mat stories on engineering and science @ 75¢ ea.

National Society of Professional Engineers
2029 K Street, N. W., Washington 6, D. C.

Sirs:

Please rush me items indicated. I enclose a check ☐ money order ☐ in the amount of $..... I understand remittance must accompany order.

NAME.....
(please print)

ADDRESS.....

CITY.....STATE.....

By Mrs. Clark A. Dunn, Chairman Ladies Auxiliary Advisory Committee.

The 1961 edition of *Engineers Wives* is off the press and soon a copy will be in the hands of every member of every auxiliary. It is our hope that everyone will use it and will avail themselves of the services of the Ladies Auxiliary Advisory Committee. The Committee wishes to thank everyone who had a part in preparing it for publication, especially the NSPE office which arranged for the editing and printing of it.

As the yearbooks from chapter auxiliaries begin to come in, it is gratifying to see that more and more of them are using the official auxiliary insignia on their covers. This is a positive way of identifying ourselves with the professional engineer.

Engineers Wives, St. Louis Chapter, began the year's activities with a brunch held in Fellowship Hall of the Engineer's Club. Its purpose was sociability and a chance to get acquainted with one another. New officers were in charge of arrangements.

A most interesting letter was received recently from the Auxiliary to the Nueces Chapter, TSPE Corpus Christi. The following is quoted from it: "On September 16, the Auxiliary was host to the TSPE for a barbecue supper, held picnic style at a park several miles from Corpus Christi. Ordinarily this event would hold no particular significance, but viewed in light of the fact that it was held less than a week after Hurricane Carla battered the Texas coast, leaving some $5 million worth of damage and virtually no electrical or telephone service in Corpus, it represents an almost superhuman effort on the part of both the Auxiliary members who planned it and the TSPE members who attended it. The planning committee was forced to work with most of its members still scattered in the various inland cities where they had fled the storm, unable to return until midweek. Since telephone communications were still far from normal, just getting in touch with all our members to tell them that picnic plans had not been cancelled was a large task in itself. Rain also hovered around to plague us.

"The attendance at the picnic was the biggest miracle of all, however. We had approximately 90 persons present. It is extremely doubtful that there were any of our engineers who had not been involved in some way in the post-hurricane "mop-up"—both personally and professionally. Many had been virtually without rest for an entire week.

"Although I am sure this was not the largest gathering ever sponsored by the Nueces Chapter Auxiliary, it is certain to be one of the longest remembered."—**End.**

Winter Professional Meeting

NSPE will hold its winter professional meeting in Jackson, Mississippi, January 25-27, 1962, at the King Edward Hotel concurrently with the annual meeting of the Mississippi SPE. Maj. Gen. Thomas A. Lane, P.E., Corps of Engineers, U.S. Army, and president of the Mississippi River Commission, will speak at the joint banquet Friday evening on "Leaders and Followers". The opening session Thursday morning will be followed by a field trip to the U.S. Waterways Experiment Station at Vicksburg Thursday afternoon, and by regional meetings in the evening. The ladies will also make the trip to Vicksburg, but will be taken on a specially conducted tour of the National Military Park, site of the opposing battle lines of the seige of Vicksburg during the War Between the States. Shown here is general chairman of the meeting Robert H. Young, P.E., of Robert H. Young and Associates, consulting engineers of Jackson. Also shown is an eastward view of downtown Jackson.

Top Ten Public Works Men Include 4 NSPE Members

NSPE is represented four times this year among the top ten public works officials. The ten outstanding public officials designated as "Public Works Men-of-the-Year" were announced by the American Public Works Association and Kiwanis International, co-sponsors of the awards, as a prelude to the recent National Public Works Week.

NSPE members among the honorees were: Hugh A. Benner, director of public works for Saginaw, Michigan; W. A. Bugge, director of highways for the State of Washington; George De Ment, commissioner of the department of public works of Chicago; and David B. Lee, director of sanitary engineering for the Florida State Board of Health.

Bugge was selected for his accomplishments in highway construction and design in the State of Washington and for service as chairman of the Highway Research Board for the National Academy of Sciences. Benner received his award for work which brought Saginaw, Mich., citations for excellence in street lighting, snow removal and water supply. De Ment was honored for application of new engineering techniques to meet the challenges posed by large communities, and for ingenuity in meeting the needs of Chicago's rapidly expanding population. Lee was cited for advice and counsel to Florida officials on water and sewage problems.

Other officials to receive the award were: D. V. Auld, director of sanitary engineering for the District of Columbia; H. A. Barnes, commissioner of transit and traffic in Baltimore, Md.; R. H. Hess, director of water and sewage treatment in Wichita, Kan.; Eugene Maier, director of the department of public works and engineering in Houston, Tex.; J. L. Vincenz, public works director for San Diego County, Calif.; and Maj Gen. A. C. Welling, who is in charge of missile base construction.

The second annual public works awards and the National Public Works Week are designed to increase public awareness of the importance of public works.

Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.
NSPE Executive Director

Chapter Evaluation

WITHIN the past few weeks each chapter president has received a new publication of NSPE developed by the State Society and Chapter Activities Committee. Designed to assist chapters in evaluating their success as the front window of NSPE, this is an important document, not so much for the publication itself as the value which may be derived through it if a chapter will take time to use it.

THE Chapter Evaluation document is much like a mirror. Of itself it perhaps has little utility except as it reflects something before it. Mirrors provide an opportunity for individuals to see themselves as others see them. In scientific apparatus and for other uses, they permit viewing an object from an angle perhaps not otherwise possible. The Chapter Evaluation program can do much the same thing. If used as a self-study technique, it permits members of the chapter and its officers to see their chapters as others see them. Such reflection will no doubt show strengths, and it is hoped that it will show weaknesses as well. Only as we see our weaknesses, can we improve.

THERE are many chapters which have gotten into a rut simply because over the years they have done things certain ways—perhaps in the past have found these methods successful. Many of these chapters, however, are failing to realize their full potential. Some may be having difficulty attracting members; others may be finding their leadership growing thinner and thinner. With turnover in personnel, it may be that current members of the chapter have just never been aware of the potential activities and programs they can accomplish in their own community to better the profession. Every member recognizes that the state society and national society can do certain things. The programs of NSPE, however, concern the individual member of the profession. Only as the programs become real to each individual member do they achieve their full value. Most of the programs of the professional society are geared to implementation by the local chapter. All programs of the national society need the support of the members. The Chapter Evaluation program suggests eleven basic areas of activity which may be evaluated—such things as:

Chapter Administration	Ethical Conduct	Meetings and Programs
Education	Governmental Liaison	
Employment Practices	Inter-Society Relations	Public Relations
Registration	Membership	Young Engineers

HOW well is your chapter implementing the professional programs of the national and state society? How well are you informed as to both what your chapter can do and what it is doing? You may want to suggest to your chapter president that this Evaluation document be the subject of a discussion at one of your future chapter meetings. The outline of the potential activities of the chapter contained in the Chapter Evaluation program can be both stimulating and enlightening.—**End.**

HANSON

(Continued from page 28)

exert their oxygen demand so slowly as to be considered non-oxidizable. Obviously a reduction in a waste's oxygen demand gives no assurance that such compounds have been removed or destroyed. How, therefore, shall we control such persistent substances found to be undesirable? This is one of the most perplexing problems of waste treatment—a first class technical challenge.

Do we make effective use of the receiving water? More and more it appears that we can depend less and less on the stream to treat our sewered wastes. Its capacity will have to be reserved for unsewered wastes, for a factor of safety and for the residual demands of wastes after we have given them the best treatment we know. The days of primary treatment are rapidly heading for obsolescence as we produce more wastes to be finally returned to an essentially fixed water supply, as we need to re-use water more and more times.

The other half of the question of adequately using the receiving water is a physical one. Presumably, available knowledge and experience on lateral mixing and dispersion of wastes in streams should permit affective use of the stream's dilution ability. At present, however, streaks of waste may often be traced many miles along a watercourse. Obviously, the effective dilution capacity is not being used. This often poses stream sampling problems because of variation in waste concentration in a cross-section of a stream. It also raises pertinent questions regarding the adequacy of outfall design. One wonders what use we are making of the science of hydrodynamics.

Many readers will have personal knowledge of the relatively poor state of the art of waste disposal into tidal waters. The field of sanitary engineering offers no question more profound than the following: "What is the fate of a particle of waste discharged into a mass of tidal water?" Every one of the 24 coastal and Gulf States is seeking, or will inevitably seek, an answer to this question. Here we have a research task and challenge for our colleagues in oceanography.

Can we monitor receiving waters intelligently and effectively? The monitoring problem has three important phases: To define what constitutes meaningful data for a given water resource; to apply appropriate sampling and analytical procedures; and to fit these data into a scheme of known water uses, waste discharges, and stream flow to permit the most practical use of data. This is a simple definition, but it covers the entire scientific base for water quality management. It offers tremendous opportunity for research on instrumentation, and on information recording and use. Chemical and electronic engineers can find plenty of opportunity and challenge in the near-virgin field of water quality measurement and instrumentation.

Can we effectively treat polluted water for re-use? I have mentioned that the main function of the modern water treatment plant is to remove particles suspended in the water, and to destroy microorganisms that manage to survive flocculation and filtration procedures. Except for removal of hardness, little attempt is made to remove soluble chemicals in drinking water. Where taste and odor are highly objectionable, carbon is usually applied, but carbon is selective in its action and sometimes it is ineffective. We actually know little about the principle of absorption as it applies to the use of carbon. Moreover, there is no assurance that harmful substances in solution will signify their presence by producing taste and odor. Here, as in waste treatment, interesting research opportunities exist.

I should like to comment a bit further on the problem of separation and purification. Perhaps you will have noted the emphasis on the relative crudeness of our techniques for separating and identifying contaminants, particularly complex organic compounds. This difficulty underlies many of our important problems. We encounter it in characterizing a waste's composition, in treating biologically resistant organics, in examining polluted waters, and in purifying water for municipal and other uses. The dissipation of major uncertainties in dealing with these contaminants hinges on the development of highly effective means for their separation and analysis.

Principles of separation essentially new to sanitary engineering—but not to the field of science—need to be applied to our problems in sampling, concentration and purification. (Such techniques as foam fractionation, emulsion fractionation, freezing, polymericion exchange, gas hydration, modified adsorption techniques, membrane processes, and other separation procedures based on fundamental principles of physical chemistry.) We are undertaking some work in this area and are endeavoring to interest others in doing likewise.

From the foregoing questions we can glean an impression of our research needs, and the nature of the physical, chemical and biological problems involved in water quality management. Both for the knowledge that we have available for application now, and for what we hope to acquire in the future, we need a framework into which the technical factors or variables involved in scientific water quality

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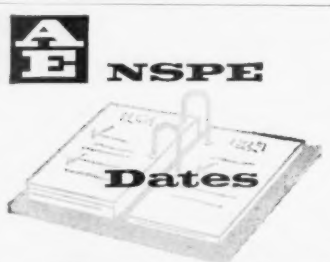


to Remember

Arkansas Society of Professional Engineers—Annual Meeting, December 8, Marion Hotel, Little Rock, Arkansas.

Alaska Society of Professional Engineers—Annual Meeting, January 9, Westward Hotel, Anchorage, Alaska.

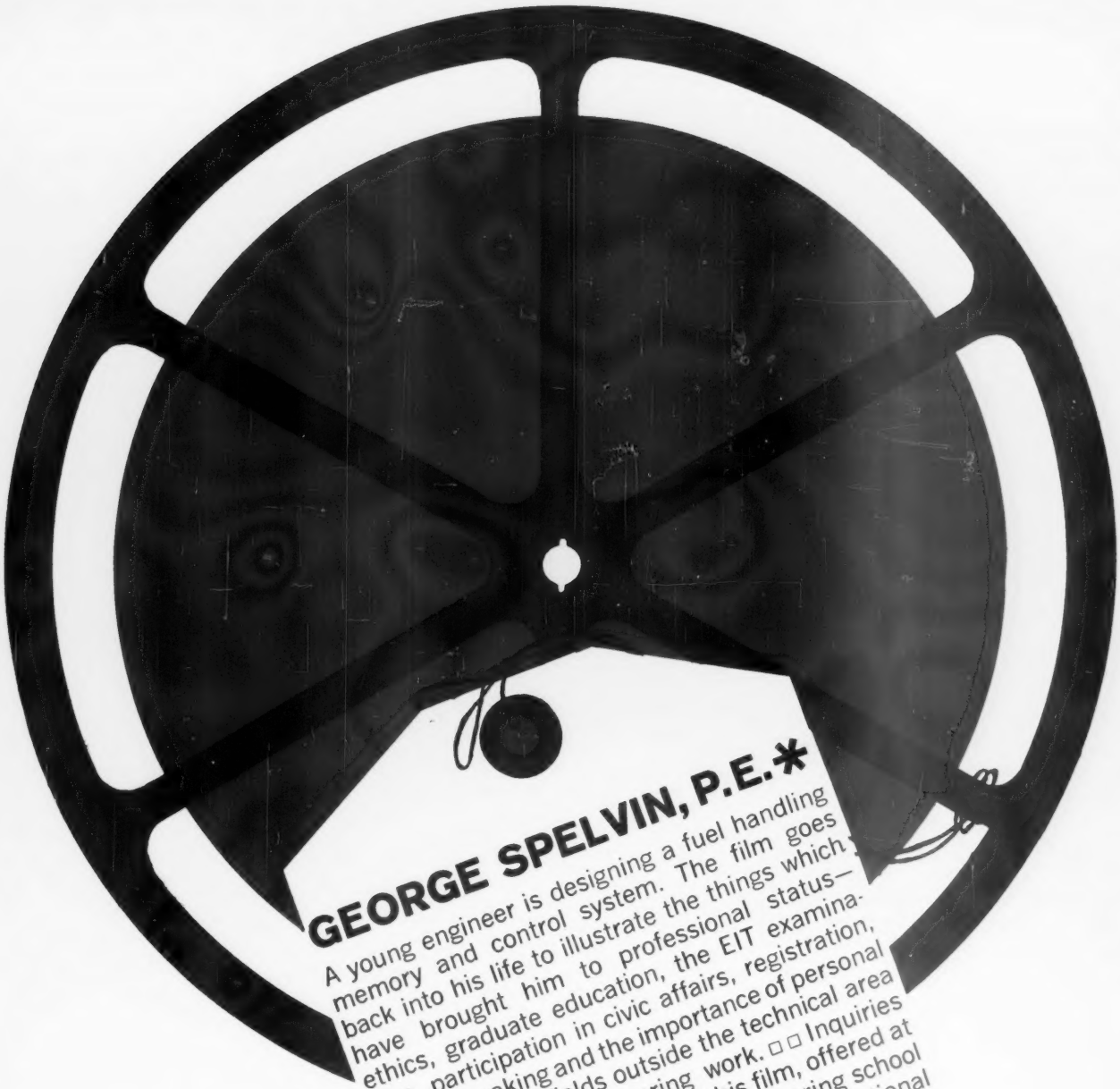
Louisiana Engineering Society—Annual Meeting, January 11-13, Sheraton Charles Hotel, New Orleans, Louisiana.

Professional Engineers of North Carolina—Winter Meeting, January 19-20, Barringer Hotel, Charlotte, North Carolina.

Texas Society of Professional Engineers—Annual Meeting, January 19-20, Austin, Texas.

National Society of Professional Engineers — Winter Professional Meeting, January 25-26, King Edward Hotel, Jackson, Mississippi.

National Society of Professional Engineers—Annual Meeting, June 13-16, French Lick Sheraton Hotel, French Lick, Indiana.



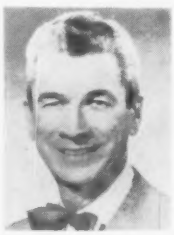
GEORGE SPELVIN, P.E.*

A young engineer is designing a fuel handling memory and control system. The film goes back into his life to illustrate the things which have brought him to professional status—ethics, graduate education, the EIT examination, participation in civic affairs, registration, public speaking and the importance of personal broadening in fields outside the technical area of specialized engineering work. □□ Inquiries concerning reservations for this film, offered at no charge, are invited from engineering school deans, and professional societies. The National Society of Professional Engineers. 2029 K Street, N. W., Washington 6, D. C. □□□□□□□

***A 23-minute color film sponsored by the National Society of Professional Engineers for showing to engineering students and recent engineering graduates.**

1962-63 Nominees Are Announced

Moving up from the office of vice president from the Southeastern Area, **Harvey F. Pierce, P.E.,** of Miami, Florida, has been nominated to lead the National Society during 1962-63. The Nominating Committee made the announcement in a memo to state society presidents during November. The presidential nominee is a member of the firm of Maurice H. Connell & Associates, Inc., Consulting Engineers, and a partner in Connell, Pierce, Garland and Friedman, Architects and Engineers. A native of Florida, he received his BSEE degree from the University of Florida in 1932. After five years with the Florida Power & Light Company, he joined his present firm in 1937. His services to the professional society have included: president of the Florida Engineering Society 1955-56, national director 1956-60, Membership Committee 1956-60, chairman 1960-61. He was the recipient of the FES Award for Distinguished Service to the Society in 1959, and for Outstanding Technical Achievement in 1961. In 1960 he received a citation from the Department of the Army for his engineering contributions at Cape Canaveral. Other activities include: AIEE, AOA, SAME, NACE, ARS, State Chamber of Commerce Education Committee. He serves also as a trustee for Riddle Aeronautical Institute, Director of the Miami Kiwanis Club and Peoples National Bank of North Miami Beach. He is registered in seven states and holds an NCSBEE certificate.



C. Ramond Hanes, P.E., of Columbus, Ohio, vice presidential nominee for the Central Area for a second term, is first assistant engineer of construction of the Ohio State Highway Department. He received his civil engineering degree at Ohio State University in 1924. He joined the Highway Department in 1928 after a brief period in industry and private practice. He is recipient of the 25-year Meritorious Service Award of the American Association of State Highway Officials. He is past president of the Ohio Society of Professional Engineers, and was the first president of the Maumee Valley Society of Professional Engineers, a chapter of OSPE. He is a member of Theta Tau Fraternity and is now serving as Regional Director. He is also a member of Tau Beta Pi. He served as a member of the NSPE Board of Directors for five years and as chairman of the Functional Section Services Committee. He is currently serving as vice president in charge of the Professional Relations Group of Committees of NSPE.

Allen S. Janssen, P.E., vice presidential nominee for the Western Area, is dean of the College of Engineering and director of the Engineering Experimental Station at the University of Idaho, Moscow, Idaho. He received both his bachelor's and master's degrees in civil engineering from that university. He served with the Idaho Department of Highways from 1930-46 and with the Agricultural Adjustment Administration in 1934 and 1936 while at the same time instructing at the University. He achieved his present position in 1946. As a member of the Idaho Society of Professional Engineers he has served as secretary of the Northern Section, chairman of the Publications Committee, chairman of the Atomic Energy Committee, chairman of the Northern Section, and as vice president, president, and national director of the State Society. He has been a member of the Idaho State Board of Engineering Examiners since 1946, having served as vice chairman three terms and as chairman once. Other organizations in which he has been active include ASCE, ASEE, Northwest Scientific Association, Sigma Xi, Phi Kappa Phi, State Chamber of Commerce, American Concrete Institute, ASTM, Highway Research Board, and the Association of Land Grant Colleges and State Universities. His accomplishments have been cited in both *Who's Who in America* and *Who's Who in Engineering.*

Thomas M. Linville, P.E., manager of the Research Operations Department of General Electric Company, Schenectady, New York, has been nominated as vice presidential candidate for the Northeastern Area of NSPE. He received his EE degree from the University of Virginia in 1926, and his AMP from Harvard University in 1950. He has been with General Electric since 1926, having been at various stages test engineer, design engineer, consultant, and manager of developmental services. The author of several articles and books on electric machines and management, he is a member of AIEE, ASME, ASEE, IRE, AAAS, and AMA. He has served as president of the Schenectady County Chapter of the NYSSPE, national director of NSPE, president and trustee of NYSSPE, and a member of the Developmental Council for Science of Renssalaer Polytechnic Institute. He is presently a member of the Inter-Society Relations Committee, NSPE.

Additional nominees may be made by members, according to the constitution of NSPE. The proper procedure for making additional nominations, which may include any member of the Nominating Committee, is by petition signed by at least fifty professional engineer members. Any petitions must be received by the Washington office by January 10, 1962. Members of the Nominating Committee are: Noah E. Hull, Houston, Texas; James A. Evans, Birmingham, Alabama; Walter S. Gordon, Tacoma, Washington; H. Paul Cooper, Houston, Texas; Frederick, B. Morse, West Lafayette, Indiana; Reed F. Morse, Manhattan, Kansas; and Phil T. Elliott, Rochester, New York.

Harry C. Simrall, P.E., nominated for vice president from the Southeastern Area, is dean of the School of Engineering, director of the Engineering and Industrial Research Station, and director of the Engineering Extension Service at Mississippi State University. He has been with that faculty since 1934 when he began teaching electrical engineering. Having received a BS in both electrical and mechanical engineering from Mississippi State, he received his master's in electrical engineering from the University of Illinois in 1939. A registered professional engineer in Mississippi, Dean Simrall has served on the Board of Directors and as president of the Mississippi SPE. Presently a national director for NSPE, he is also a member of the Mississippi State Board of Registration for Professional Engineers. He is chairman of the Research Section of the Engineering Division of the American Association of Land Grant Colleges and State Universities, and vice president in charge of the Administrative Unit of the Southeastern Section of the American Society for Engineering Education. He is also a member of AIEE, IRE, IES, ASAE, Tau Beta Pi, and the Starkville Rotary Club.

J. Neils Thompson, P.E., vice presidential nominee for the Southwestern Area, is a professor of civil engineering at the University of Texas and director of the University's Balcones Research Center. He received both undergraduate and graduate degrees in civil engineering from that institution, and after working for the Texas Highway Department for a number of years as a research engineer, joined the University faculty in 1941. A past president of the Texas SPE, he has been a national director since 1955 and has chaired several committees, presently: NSPE's Student Professional Development Committee and TSPE's Junior Engineers Committee. He was recipient of the American Concrete Institute Wason Medal for Noteworthy Research in 1953, and of the Engineer of the Year Award for 1960 from the Travis Chapter, TSPE. He is a nominee for director of the American Concrete Institute for 1962-64. Among his other honors are: Tau Beta Pi, *Who's Who in Engineering*, and American Men of Science. He holds membership in ASCE, ASTM, American Society for Engineering Education, American Concrete Institute, and has held offices or committee chairmanships in each. Service to his community includes membership on the Governor's Advisory Board of the Texas Industrial Commission, director of the Travis County Red Cross, member of the Austin Chamber of Commerce, and member of the Austin Kiwanis Club.

Waldo W. Wegner, P.E., of Cedar Rapids, Iowa, vice presidential nominee for a second term from the North Central Area, is a civil engineer for Loomis Brothers, General Building Contractors in Cedar Rapids. He received his BS in civil engineering from Iowa State University, Ames, Iowa, in 1935, and continued doing graduate work at the University of Chicago while serving a public works apprenticeship with the American Public Works Association. He has served as city engineer for Cedar Falls, and Mason City, Iowa. Following a term with the Civil Engineer Corps, USN, and one as city manager of Chariton, Iowa, he joined the Portland Cement Association until 1956, when he accepted his present position. He has served as president of the Cedar Rapids Engineers Club and the Iowa Engineering Society. He is a past national director from Iowa, and served as chairman of the Young Engineers Committee. He currently is responsible for the Professional Employment group of committees of the NSPE. Among his nonprofessional activties, he has served as president of Cedar Rapids Rotary Club, chairman of the Board of Appeals to City Building Code, member City Planning Commission, and a member of the Iowa State University Alumni Association Executive Committee.

Russell B. Allen, P.E., of Silver Spring, Maryland, nominated for a fifteenth term as treasurer, is assistant dean of engineering at the University of Maryland. A professor of civil engineering, he has also served as head of that department, and acted as coordinator for the design, construction, and equipment of the new buildings of the Glenn L. Martin Institute of Technology of which the engineering college is a part. A native of New Haven, Connecticut, he received his B.S. degree at Yale where he served for five years as an instuctor in civil engineering while taking graduate work in structural engineering and architecture. He spent several years as a construction engineer with the Boston and Maine Railroad and was also engaged in private practice before going to Maryland in 1933. He was instrumental in getting an engineering registration law passed in Maryland and was a founder of the Maryland SPE, serving as its first secretary-treasurer, its second president, and several terms as national director.

HANSON

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management may be fitted. At present we have the elements of a concept of water quality management. Expressed simply, it is a system for providing the right quality of water at the right place. It embodies a set of procedures for keeping each segment of the surface water resource in the continuous dynamic balance necessary to meet the requirements of each significant use. The concept may be considered simple, but the development of it in a form practical for application is not simple. The process may be likened to a system of accounting, where deposits, withdrawals, fluctuating values of assets, varying rates of interest, simple and compound, are expressed continuously in terms of running balances and other management expressions, essential to assessing and guiding an enterprise. It is somewhat in this fashion that I visualize the concept of water quality management—pollution control if you prefer—emerging into an art and practice.

The resources behind the scene will be scientific staff, laboratories, instrumentation, basic data, measurement techniques, computer technology, theoretical and applied mathematics. On the stage will be all of the competing and conflicting economic, political, social, legal, administrative and technical actors. In the audience are the critics, professional and lay, the jury, the public—striving to make sense out of the chaos; trying to separate fact from emotion; trying to separate basic issues from selfish interests; trying to identify the principles which can serve as firm foundation for law and practice. As professional engineers, AMERICAN ENGINEER readers have an opportunity and obligation to participate in the formation of public policy in both the technical and nontechnical aspects. The public has a right to expect recommendations from you, based on your most thoughtful study, analysis and discussion. This is indeed a challenge, perhaps a little different from that to which we have been accustomed, but one where we cannot afford to be found deficient. **—End.**

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SPECIAL REPORT

(Continued from page 34)

be maintained not only with the National Societies but also with local chapters and many firms and individual members." It will be necessary, the DOD added, "for many more architects and engineers throughout the country to inform themselves on the newly developed methods and techniques for designing shelters and other structures to resist the effects of nuclear weapons. In so doing they will not only better prepare themselves to serve their clients but will acquire the background of factual information so necessary to assert their leadership in problems facing their cities and their communities."

Engineers wishing to participate in the shelter survey should apply directly to the Army Engineer and Navy Yards and Docks District Offices listed here. Others should apply to the Civil Defense Regional Offices listed previously.

Alabama—U. S. Army Engineer District, Mobile, PO Box 1169, Mobile, Alabama; Alaska—U. S. Army Engineer District, Alaska, PO Box 7002, Anchorage, Alaska; Arizona—U. S. Army Engineer District, Los Angeles, PO Box 17277 Foy Station, Los Angeles, California; Arkansas—U. S. Army Engineer District, Little Rock, PO Box 867, Little Rock, Arkansas; California—U. S. Army Engineer District, Sacramento, PO Box 1739, Sacramento, California; Colorado—U. S. Army Engineer District, Omaha, 215 No. 17th Street, Omaha, Nebraska; Connecticut—Director/Area Public Works Officer, Atlantic Division, Bureau of Yards and Docks and Area Public Works Office, New York, 90 Church Street, New York, New York; Delaware—District Public Works Officer, Fourth Naval District Bldg. 1, Naval Base, Philadelphia 12, Pennsylvania; District of Columbia—Area Public Works Office, Area Public Works Office, Chesapeake, U. S. Naval Weapons Plant, Washington 25, D. C.; Florida—U. S. Army Engineer District, Jacksonville, PO Box 4970, Jacksonville 1, Florida; Georgia—U. S. Army Engineer District, Savannah, PO Box 889, Savannah, Georgia; Hawaii—U. S. Army Engineer Division, Pacific Ocean, Building 96, Fort Armstrong, Honolulu 13, Hawaii; Idaho—U. S. Army Engineer District, Walla Walla,

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VAN PRAAG

(Continued from page 35)

expansion of the activities of this important leadership group will enable it to render a more far reaching and far more valuable service to the profession, society, and national welfare. This is progress.

In still further effort in pursuance of a more effective organization of the profession, we now find the three largest professional engineering groups, AIEE, ASME and NSPE, pursuing common courses and common objectives in support of an implemented functional concept. These three major societies are now entering into a formalized common agreement on the pursuance of their professional objectives. Other societies are meeting with and discussing cooperation in this same effort. This is progress.

The forgoing are only a few illustrations of unmistakable progress. We are truly making progress.

The proposed additional membership grade of NSPE is just one more important step in the direction of unity and the so much desired unified voice of the profession. For many years it has been urged by others that NSPE membership is not sufficiently all-inclusive that NSPE can be the voice of the profession on professional matters. There is some merit to this position. The proposed membership change will appreciably strengthen NSPE and remove substantial objection to its speaking more effectively in professional matters. It offers a means of permitting members of the profession, highly qualified and respected as such, to voice opinion in and through NSPE. This is accomplished, too, without jeopardy to the long and jealously guarded and protected status of registered professional engineers.

NSPE will be strengthened, not weakened, by the membership change. The membership change is not opening the doors wide to any and all who proclaim themselves professional engineers. Those who now hold grade of Member by virtue of their being legally registered as professional engineers, continue their membership under the favored grade of Professional Engineer Member. The new membership basis accepts into membership, with a grade of Engineer Member, only selected persons who are members of nationally recognized engineering societies and who have been by those societies carefully screened for their professional qualifications. Even then, the grade of Engineer Member has a limi-

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tation of years during which the individual may be accepted to membership in NSPE. It is most important to recognize that the national engineering societies, from whom Engineer Members will be accepted into NSPE, must first have a constitutional requirement in their respective societies that will require all future entrants into the particular membership grade eligible for NSPE membership to hold valid and legal certificates of registration. Engineering registration will thus become an accepted and accomplished fact within a reasonable period of time in all of the participating societies, if NSPE membership is to be permitted the now nonregistered engineers.

If there were no time limitation, and if there were no carefully screened membership requirements by the several societies from which NSPE proposes to accept certain qualified members, and if there were no requirements by those several societies that NSPE eligible members be required to first have (within a reasonable time) legal registration of those members, I would be compelled to take an equally vigorous stand against the proposed membership change in NSPE. But these are satisfactory and wise limitations, carefully conceived.

The plan of membership as now proposed is not perfect. This is admitted. Nevertheless, the plan offers great potential and the plan is certainly a realistic and reasonable approach to the more perfect plan. The proposed membership plan has been studied and worked out most carefully after repeated discussions by the NSPE Inter-Society Relations Committee in counsel with other engineering societies and with men of distinguished reputation in engineering, both within and without our society.

It is my considered opinion that we are making progress, slowly but surely, with fairness and with firmness, in the direction of a unified engineering profession and we are perfecting the "voice of the profession".

I recommend and urge a favorable vote in behalf of the proposed changed membership requirements in NSPE. I vote "AYE".—**End**

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LETTERS

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employed. The astounding number of new products appearing on the market every day indicates that creative thinking is anything but dead. Assuming a problem exists I can see no practical merit in his proposed solution, setting up a system of government subsidies to pay independent inventors' patent expenses.

In support of his premise, Mr. Cavanagh recites as commonplace some business pratices which are so unusual that I have never encountered them in twenty years of dealing with independent inventors, employed inventors, and employers of inventors. To cite only one example, he states that "Several Concerns in an Eastern city have found it expedient to have one member of the company sign all patent applications under the pretext that it is 'all going into the same pot'." The management of any company which engages competent counsel and regularly files patent applications is certainly informed of the fact that a patent filed in the name of some one other than the actual inventor is void. It is difficult to believe that there are many executives who deal so recklessly with their companies' patent assets, especially as there is no point in doing so. The real inventors are available to sign the applications and bound by their employment agreements to assign their inventions to the company.

The picture of exploitation of employed inventors is also greatly exaggerated. Rather than picking a man's brains for a short time and then firing him, most companies try to attract and keep good men in their research departments, and use their creative talents effectively. There may be some genuine instances of unfair treatment, but these are the rarity rather than the rule. So are employment agreements which impose restrictions beyond those absolutely necessary to protect the company against the possibility that an unscrupulous employee might walk out and give a competitor some valuable information acquired at the company's expense.

Furthermore, the independent inventor is by no means extinct. It is still possible for an inventor to start

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a business and manufacture the invention himself.

Some of our clients are running very successful businesses which they began this way. Significantly, most of these clients are graduate engineers, and all had acquired practical experience in the field of their invention by working for some one else, before they started their own businesses. True this road to success is a rocky one, and the mortality rate among new businesses is high. Nor does this course guarantee the inventor the maximum opportunity to use his creative talents. A common complaint among our clients who are in business for themselves is that their days are so taken up with problems of production, sales, financing and the myriad other details of business management, that they can't find enough time to work on new developments.

If it is more difficult now than it was fifty years ago, and it wasn't easy then, for an inventor to start his own business, this situation is due, not to any fault in the patent laws, but to other factors which apply equally to all kinds of new businesses, for example, our present tax system. The high tax rate on individual incomes in the upper brackets has made serious inroads into one source of capital for new, high risk enterprises. The corporate tax structure makes it virtually impossible for a new business to finance its growth by the time-honored method of plowing back its profits. Even the initial formation of the business is beset with tax pitfalls for the unwary.

Mr. Cavanagh's proposal to subsidize an independent inventor's patent expenses would scarcely touch the real problems confronting the independent inventor. Anyone who has been through the mill knows that the time and expense involved in making an invention and getting a patent on it are a drop in the bucket, compared to the capital, time and effort required to get a new product into production and on the market. A loan of $500 for patent expenses to a man who lacks the business and sales ability to interest a qualified manufacturer in a license or raise the $50,000 or more in capital which he needs to go into business himself, would be entirely wasted, even though the invention had considerable merit.

There is another serious objection to Mr. Cavanagh's proposal. Every patent attorney in private practice is familiar with the "I have an idea" type of inventor. An experienced attorney can recognize the type as easily as the family doctor can spot a case of measles. This type of "inventor" ordinarily has no technical training, experience, or even speaking acquaintance with the common technical and trade terms, in the field of his proposed invention. Rarely has he gone to the trouble of producing even a crude model or an intelligible drawing. His invention, if any, is trivial. Often he has nothing but a nebulous idea. Nevertheless, he is firmly convinced that all he has to do is send some kind of paper to Washington, and he will automatically get a patent and make a million overnight. No amount of sound advice will change his mind. When his get-rich-quick dream fails to materialize he will complain long and loudly about his exploitation by unscrupulous attorneys and businessmen.

An attorney confronted with one of these time wasters has a way out. He can decline to take the case. A government board would be obliged to give a full hearing to all comers. The prospect of free services is bound to lure these would-be inventors in droves as to their contribution to the progress of science and the useful arts, which our patent system is designed to promote, there may be some truth in the adage, "Even a blind hog can sometimes root out an acorn," but the expected return would scarcely justify a Federal subsidy for blind hog raising.

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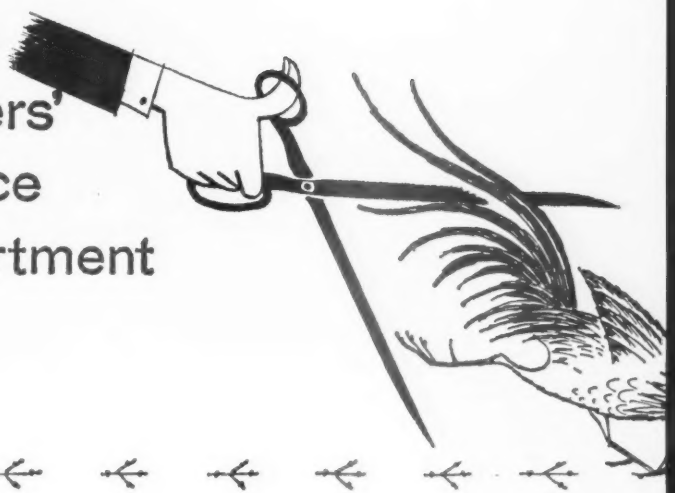

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December, 1961

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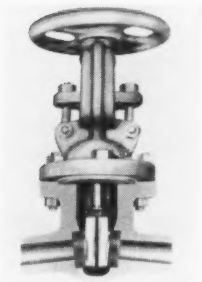
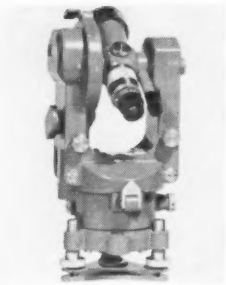
Progress in Products

BI-VALVE — Item 30



A new type valve just introduced by Chapman Valve Mfg. Co. featuring self-conforming, positive seating and absolute shut off. Bi-Valves are designed around a swivel principle which permits the discs to individually conform to seat faces even with severe pipe strain or distortion due to temperature swings. Made of steel, Bi-Valves come in sizes from 2" up in all pressure classes, and permit use of smaller pipes, valves and fittings in many areas in chemical, petroleum, power and marine applications.

TELESCOPE — Item 31



In addition to the internationally standard inverted image T-16 Optical Transit, Wild Heerbrugg Instruments, Inc., has made available the T-16E with Erecting Image Telescope for upright images. Both models feature quick circle readings. No need to set micrometer. Upper and lower motions are eliminated. Repetitions and zero setting are made with a circle clamp. Uses include mining, construction and building surveys, layout and general engineering.

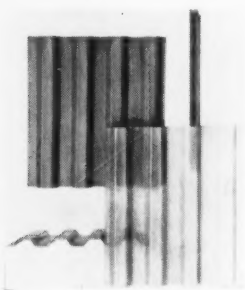
URETHANE FINISH — Item 32

A pigmented polyurethane coating with exceptional resistance to abrasion and chemicals, unusual flexibility, fast dry, and long wear, is now available from Du Pont Co.'s Fabrics and Finishes Dept. "Imron" urethane enamel features the same properties as Imron textile floor finish, an oil-free urethane clear coating. It is presently available in grey, green, ivory, yellow and black, provides an extremely hard but elastic finish ideally suited for protection of floors, structures, and equipment subjected to constant abrasion or abusive foreign matter, and can be applied to wood, masonry, concrete and metal.

ELEVATOR — Item 33

A completely redesigned material handling elevator for the construction industry has been introduced by the American Tubular Elevator Div. of Universal Mfg. Corp. Simplified erection, versatility, savings in erection time, and safety are key features of the elevator, Type HT Panel Tower. It is easy to convert a single well Panel Tower to a double well and vice versa. Concrete handling is simplified. A new type boom with capacity of a ton has been developed. The new tower weighs less than similar conventional towers. Another time-saving feature permits continued erection of the tower without removal of the cathead and provides a guard rail during installation.

BUILDING PANELS — Item 34



Allied Chemical's Barrett Division will soon start production of a new type of incombustible plastic building panel, extruded from polyvinyl chloride resins, which will offer the significant advantages of nonflammability and availability in virtually unlimited lengths. Two types, opaque and translucent, will be available in flat and corrugated forms.

CHAIN TEMPLATE — Item 35

Jacko Corporation has presented a see through chain template made especially for draftsmen and engineers to simplify and speed accurate chain drawing details. Easy to use. This new chain template will save hours of painstaking work and enable the user to be much more thorough on drawings with chain detail. Known as Model CT-613, the template is pocket-sized at 2½"x5⅛".

VALVES — Item 36

Rockwell Manufacturing Co. has produced a new tapered plug valve design utilizing a high lubricity plastic coating that reduces turning and provides life-time maintenance-free operation. Rockwell Permaturn valves are designed to handle services ranging from jet fuels and chemicals to water and sewage. Major new design feature of the valves is a high lubricity plug coating applied to tapered surfaces. For low pressure Permaturn valves the coating is Teflon, a polyfluoride thermoplastic with an extremely high softening point. For high pressure services the valves are coated with phosphate-molybdenum disulfide.

DELINEATOR — Item 37

A roadway delineator which combines the advantages of wide angle reflection and prismatic plastic has been announced by Minnesota Mining & Mfg. Co. Visible at wide angles in headlights at night, they continue to work as safety devices even when posts are bent out of position. Wide angle characteristics simplify work of maintenance crews in aligning them along curves and other hazardous areas. Called "Reflecto-Lite," these three-inch center-mount reflectors are available in silver, amber or red, with or without aluminum housing, are dustproof and waterproof.

This feature describes new products of general interest to professional engineers. For further information, circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

These listings are informational and are not an endorsement of the products, nor of the manufacturer's claims.

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	$ Millions
Building Supplies	5,264
Prestressed Concrete & Cement	3,074
Construction & Building Items	2,363
Waterworks & Hydraulic Equipment	3,098
Construction Machinery	279
Electric Wiring & Equipment	1,971
Airconditioning & Heating	1,811
Other Materials & Equipment	5,862

Large P. E. circulation to key men in consulting engineers' offices and in the building and construction industry assures direct contact with the men who purchase and specify. Almost half (45%) of AE's readers have been in engineering for 20-years or more. A 1958 circulation analysis of 18,713 respondents (a 41% reply) classifies the readers by:

MAJOR FIELDS OF EMPLOYMENT:	%	No. of AE Readers
Consulting engineers (Priv. Practice)	21	12,542
Construction contractors (building & heavy const.)	9	5,375
Government, Engineers in:		
Federal	7	4,181
State	9	5,375
County and Municipal	6	3,584
All Industries	35	20,904
Public Utilities	9	5,375
Education	3	1,792
Other	1	597
Total	100%	59,725

ENGINEERING FUNCTION:	%	No. of AE Readers
Civil Engineers	43	25,682
Mechanical Engineers	24	14,334
Electrical Engineers	18	10,750
Chemical Engineers	3	1,792
Mining & Metallurgical Engineers	3	1,792
Other	9	5,375
Total	100%	59,725

Active circulation is indicated by the December, 1960 BPA statement which showed a net circulation gain of 10.0% and a 1.9% removal in the prior six-month period.

AE CIRCULATION GROWTH

Professional Engineers are Purchasing Engineers . . . they make the important difference. Reach them in number, at low cost, in their own book.

Proved High Readership & Interest is shown again by a recent (April, 1961) Readex study showing:

MONTHLY EDITORIAL DEPARTMENTS	% Respondents Interested*
AE This Month	63
General News	78
Industry News	75
Consulting News	55
Education	45
Government	49
Strictly Business	22
EDITORIAL FEATURES	
The President's Peace Corps	67
M.I.T. Looks to the Second Century	52
Review of a Case by the Board of Ethical Review	52
Professional concepts for Engineering Students	34

*These figures go beyond mere noting or reading, but indicate the percent of respondents interested in the editorial.

Previously, an (August, 1960) readership survey of 441 respondents (a 22% reply) showed high readership. Thirty-one percent read three-fourths of the issue and 36% read half or more. Twenty-one percent read one-quarter or more and 10% read 12% or less.

AE's unique editorial content concerns itself with its readers' professional and career needs, not covered in other publications. Nontechnical articles deal with current developments in industry, business and government interesting and useful to all engineers in their work.

Continued acceptance and a 700% circulation increase in the past 17-years still show the American Engineer to be the professional engineer's media. The readership comprises only Professional Engineers (84%) and Engineers-in-Training (14%).

Lower in cost than any major publication in its field, rates are $6.87 per thousand for total circulation. AE's 12,542 consulting engineers are reached at $32.60 per thousand.

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Advertising Director
Leonard Bleyer, Jr.
230 Park Avenue, Suite 1509
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